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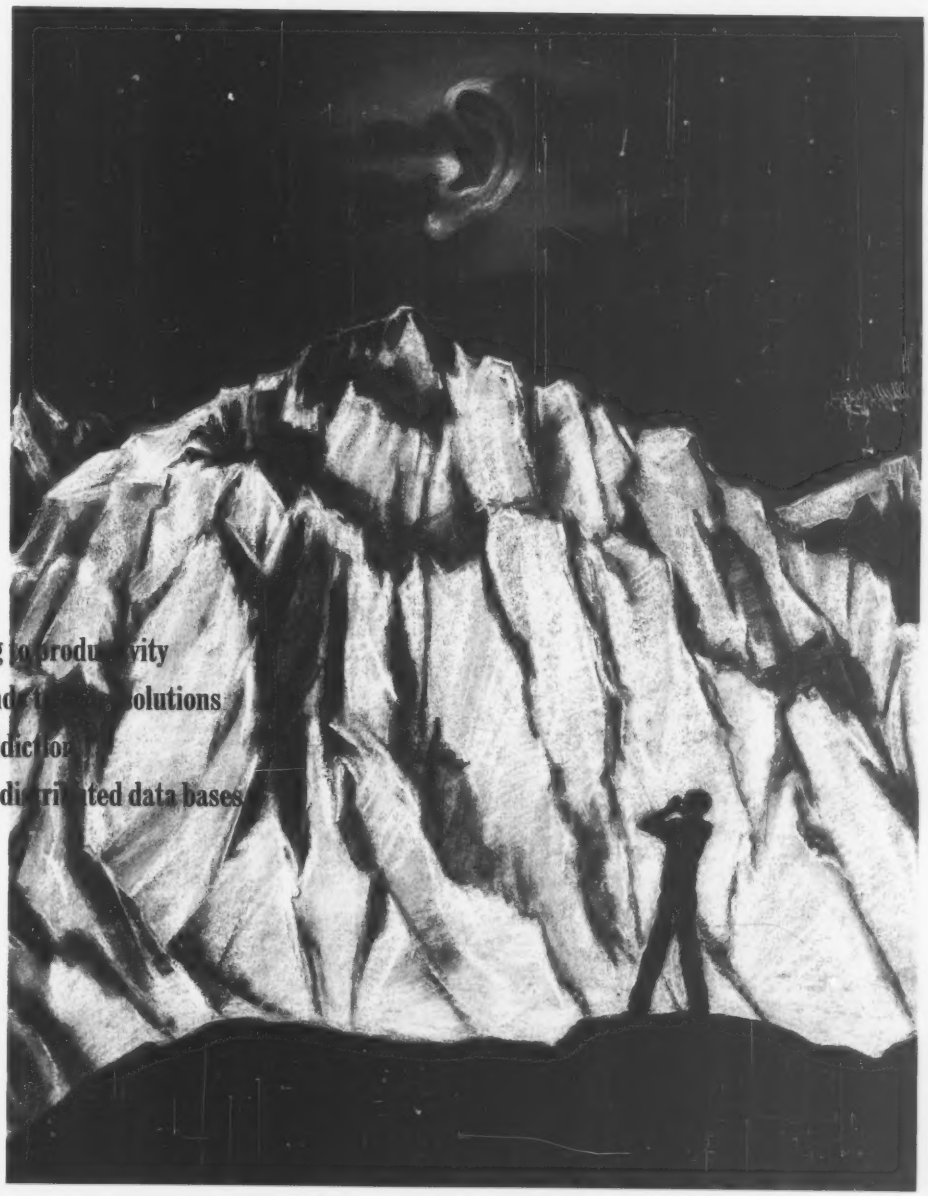

- Connecting to productivity
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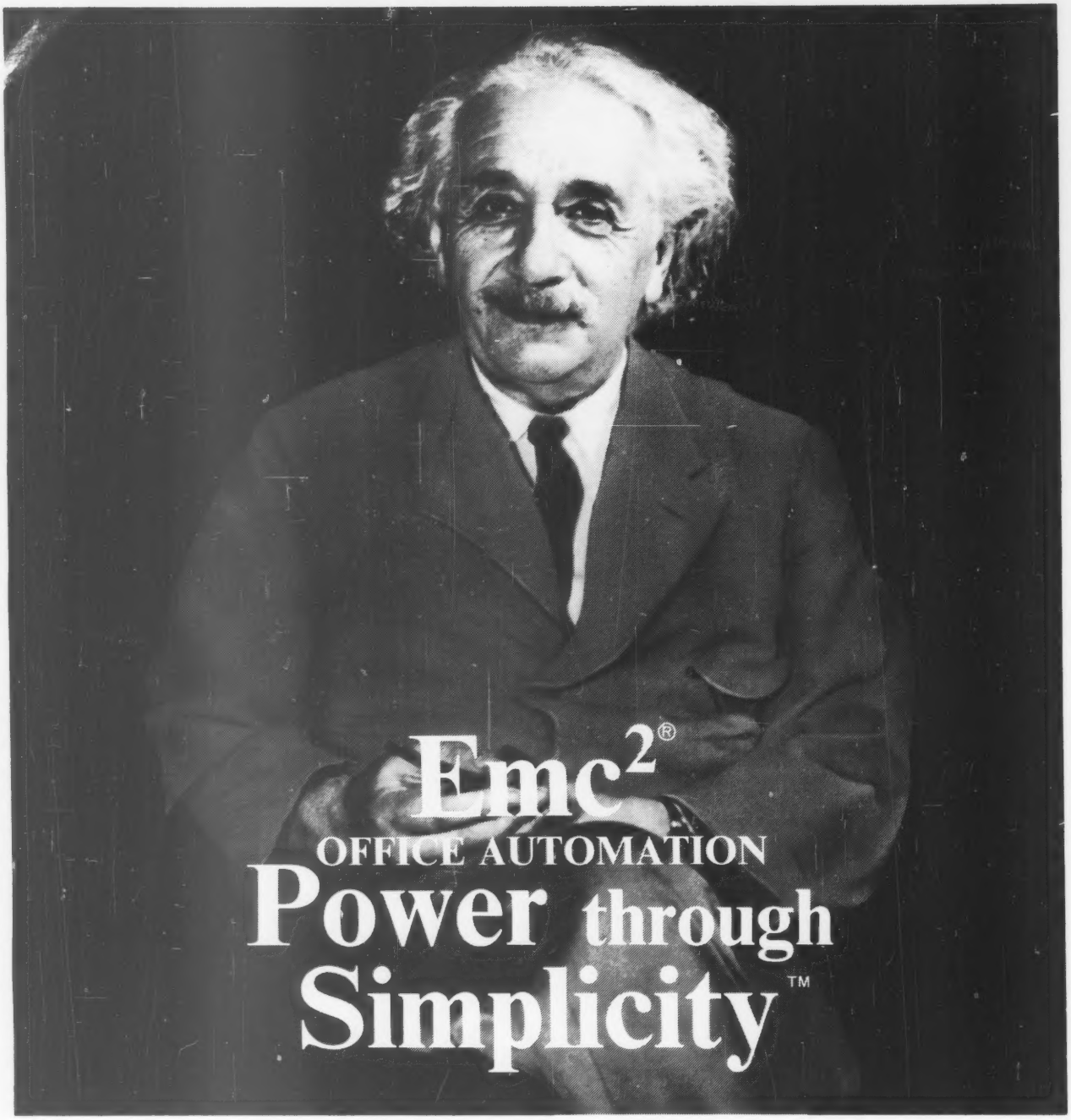

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in focus

DIRECT CONNECTION TO PRODUCTIVITY

There is a deep bond between connectivity and productivity that, when understood, can help organizations reach their corporate goals. The author examines how adopting computer-based forms to convey business information can enhance individual knowledge, group cooperation and enterprise goal monitoring. By strengthening the machine-to-machine links, you can fortify the people-to-people links as well. By Paul Strassmann. *Page 16.*

STRATEGY, NOT TECHNOLOGY

A recent poll of communications professionals by *Computerworld Focus* found that this group is turning its concentration from technology to its application. Gaining an advantage in a competitive world through strategic use of technology is paramount for them. Discover the other subjects — promised offerings, competing vendors and standards and government regulations — about which your peers feel strongly. By Michael Tucker. *Page 23.*

Distributed data bases

By Stan Kolodziej. Advances in data base technology, especially the success of the relational market behind such standards as SQL and DB2, are making many MIS managers take a second look at distributed data base management systems. With LAN vendors playing their part and moving applications from minicomputers and mainframes to networked PCs, true distributed DBMSs may soon be here. *Page 35.*

Can you ignore EDI?

By Patricia Keefe. Many companies that have converted to electronic data interchange systems quickly find out that these tools are a competitive necessity. Time savings, personnel reductions and elimination of geographic barriers are just some of EDI's oft-cited benefits. With an ANSI standard poised to ease EDI systems incompatibility, the EDI market is expected to really take off. *Page 39.*

COVER BY SCOTT REYNOLDS

SPECIAL SECTION

LAN analysis

At what point do you turn to outside personnel for network installation and maintenance? Should you handle these sometimes laborious tasks yourself? Stan Kolodziej scrutinizes these critical issues and talks to the users, vendors and consultants who are grappling with these questions. Plus, analyst Lee Doyle examines the importance of IBM's OS/2 LAN Server to you. Begins on page 27.

From the Editor
Including your letters to us. *Page 5.*

Manager's Corner
Jim Young on ethics in the MIS profession. *Page 6.*

Q&A
A communications consultant says the future is IBM's Systems Application Architecture. *Page 10.*

News & Analysis
Mobile satellite consortium; E-mail update; cable-based vs. wireless LANs; TCP/IP's status; IBM and DEC in the network management arena. *Page 11.*

Blue Beat
Deidre Depke on IBM's downsizing days. *Page 43.*

Products
Tech Talk on Intel and Microsoft's awkward market position; Jnet networking software; Transputer-based systems. *Page 43.*

Calendar
Industry events. *Page 46.*

The Insider
Michael Millikin on the battle of the buses. *Page 48.*

Log Off
Scrutiny of LAN vendor market share. *Page 48.*

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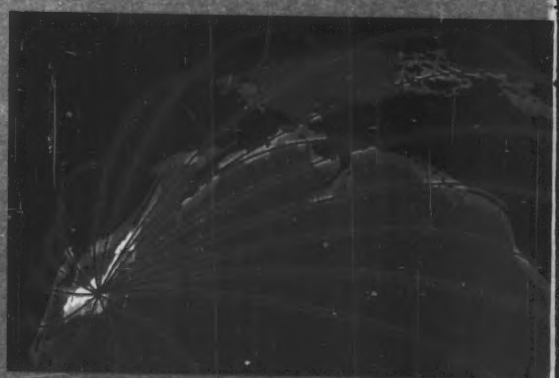

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FROM THE EDITOR

Greene in judgment

Is U.S. District Judge Harold H. Greene helping anyone with his recent opinion concerning the Modified Final Judgment? Certainly not the regional Bell holding companies, which must now operate for another three years under the business restrictions imposed on them when they were spun off from AT&T. Judge Greene has firmly shut the door on the holding companies' research and development activities involving manufacturing. Although Greene allows the firms to develop software, which is certainly a part of the equipment used in public-switched telecom networks, he has clamped the lid on any R&D efforts to manufacture that equipment.

Greene's recent decision also stepped on the toes of the Department of Justice, chastising it for failing to investigate violations that have taken place since the Modified Final Judgment.

On the other hand, AT&T, other interexchange carriers, the equipment manufacturers and information service providers undoubtedly applaud the decision. Their contention is that the holding companies pose a serious anticompetitive threat even when operating under current restrictions and, therefore, could create a truly unfair stranglehold on their competitors if the bonds are loosened.

Greene explained his ruling by citing that the "decree was aimed at preventing the anticompetitive practices in which the Bell system was assumed to have been engaged in the past." Another consideration of the decision, however, is how these restrictions will affect the information industry as a whole. Under the current rules, little incentive exists for the regional holding companies to promote or experiment with new technologies. At the core of the disagreement over the rulings has been a failure to define terms and intent clearly. The rulings have not always been specific enough to avoid disagreement and confusion over what is to be allowed and what is not. Therefore in the future, for instance, the Bell companies may be forced to divest subsidiaries involved in R&D and curtail future acquisitions.

Judge Greene is trying to define various stages and components of the information industry and its technology that are already well integrated or still evolving. Few in the industry can do this with any great confidence. Putting these key decisions in the hands of a jurist outside of the industry is a dangerous gamble.

Ann Dooley

Soviets in glass houses shouldn't throw stones

I was appalled by Mr. Baidak's letter (*CW Focus*, Nov. 4, 1987) decrying the quality of information at the Information USA expo in the Soviet Union. It isn't that a Soviet journalist should not be heard or that we should censor his views (we are, after all, committed to free speech), but it is the Mount St. Helen's of impertinence that a spokesman of a dictatorship of the proletariat can preach to us about a lack of a free flow of information.

LETTERS TO THE EDITOR

CW Focus readers may be appropriately reminded on the 70th anniversary of the Bolshevik revolution that one of the main accomplishments of that revolution was the total and permanent control of all information by the Soviet Communist party. The concept of the free flow of information in the Soviet Union is unknown. With this as background, Mr. Baidak's criticism sounds very hollow, indeed.

On the other hand, I wholeheartedly agree with Mr. Baidak's observation that the Soviet Union is lagging behind the U.S. in information management technology.

I believe that our lead will remain, not because Soviet engineers and scientists are any less competent than ours, but because the ruling ideologues cannot allow their citizens free access to information and, therefore, to the machinery that processes it. As long as that is the case, the Soviet Union will be drooling for our information technologies.

We develop technologies and products for markets and customers. What may seem like toys and second-grade stuff to Mr. Baidak and the Soviets are consumer and business products to us.

What is on display at our technology exposition is not merely software and hardware but products that a free-spirited nation offers to its consumers who are free to choose how to use the tools. Some use them for entertainment, some for investing, some for education, and there are even those who use them to write letters to editors. But most important, the users are free to choose. So, if our youngsters want to learn about programming for engineering and scientific uses, they are free to do so, but they don't *have to*.

It may be that our messengers at the Information USA expo could use some technical training, but that would not change our fundamental way of thinking, nor would it change the contents of our exhibit.

Tibor G. Szekeres
Vice-President, Engineering
Teleos Communications, Inc.
Eatontown, N.J.

Reader challenges analyst's prognosis for mainframes

William Zachmann's viewpoint article titled "Mainframe dinosaurs" in the November 4 issue of *Computerworld Focus* has him back with his prognostications on the demise of mainframe systems, mainframe suppliers and all the sundry people unfortunate enough to be involved. In keeping with tradition, Mr. Zachmann gives no facts that the reader might use to exercise judgment on the wisdom of his blabberings.

If Mr. Zachmann really believes that it is the "economics of the transition to second-generation information systems that will provide the dynamic of change," he should be called upon to produce some documentation of facts, trends or other data that provide support for his sweeping conclusions.

Continued on page 10

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MANAGER'S CORNER

In defense of MIS's honor

Jim Young

When people make a commitment to something, they tend to become righteous and even a little defensive. Information systems should be important enough to be one of those commitments.

Those of us who have chosen the information systems profession like to believe we have selected a worthy and valuable field of endeavor. Unfortunately, others can easily jeopardize our sense of mission and our feeling of self worth by trivializing them, placing our role in corporations on par with that of computer games. While we can dismiss some of these reactions as having been generated by harmless ignorance, there are more devastating and deliberate innuendos that imply our profession is without moral responsibility.

The cause of this feeling is varied. Many have asserted that because programming is a task of applying inflexible rules, the whole profession is trained to be mechanical and robot-like. They further claim that the focus of the information systems profession is on machines and technology, not on humanitarian and social issues. They go so far as to say one reason for excluding MIS from company leadership positions is that senior management simply does not trust the motives of MIS professionals in recommending technology. This image is unacceptable to me and should be a cause for alarm in a profession that is playing an increasingly pivotal role in society.

Bad to the bone?

I like to think there is nothing intrinsically bad in computing. However, like anything else, technology can be abused. And just as recent problems with pit bull dogs ultimately reflect on the animals' owners, so, too, computer misuse ultimately reflects on the keepers of technology, namely, MIS. Our profession has traditionally assumed the stewardship of technology, including the responsibility to lobby for and guide the prudent and fair deployment of computing. Likewise, we certainly should recognize and address concerns in this area, remedying problems and correcting misconceptions.

After the recent collapse of the stock market, many MIS professionals were accused of being tainted by association with computer-generated trading, a technology that contributed to the instability of free markets. I know nothing about programmed trading, and I am no expert on the mechanics of the stock market. But I do get indignant at the offhandedness of the accusations that the computer was responsible and that technicians contributed to the misuse by following its orders.

Programmed trading may have been a "loose cannon on the deck." However, I cannot believe that information systems professionals did not evaluate the possibility of what occurred. For that reason, I have to think that either the inanimate computer is being vilified because it is an easy culprit or, if programmed trading is to blame, it is due to obscure and complex reasons that were not obvious to an otherwise concerned MIS.

Everyone in business must face and deal with the broad ethical issues. In addition, there is a growing body of ethical issues unique to such selected areas as information systems. Being a professional is not just possessing special skills but also taking charge of the responsible use of those skills. Moreover, a true professional can apply these skills to make moral judgments, such as recognizing areas of danger or harmlessness that a layman might not detect. In no area is this professional responsibility more important than in information systems. The specialized ethics of MIS go beyond not pirating software. It is exercising the responsible use of computing.

In dealing with other MIS professionals, I give them credit for the same integrity I like to think I practice. A doctor once justified the past practice of not testifying in court against another doctor by saying this custom was not a mutual protection pact but respect for the situational and circumstantial decisions or actions of another professional.

The opportunities for social abuse go beyond stock market program trading. Abuse might involve invasion of privacy, job elimination, depersonalization of work or use of technology in illegal or unsavory ways. Our job is to prevent the technology that we manage from contributing to any of these or other undesirable ends.

And our job goes further. It requires that we not be enamored with the technology or with building empires to our skill. Rather, we must be driven by the benefits we can give to organizations and even to society. Many of the nuclear scientists at Alamogordo, N.M., now regret the weapon they created but said that, at the time, they were too caught up with the excitement, the challenge and the science to think of the consequences. As professionals, we cannot be so in love with the technology that we are not in a position to judge when it is used unwisely.

Because we are in a position to be knowledgeable of risks, we must advise of the dangers. We all are aware of the duty to protect our organizations from computer abuse. We also have a duty to prevent companies from becoming inadvertent computer abusers or irresponsible

Continued on page 10

Young is managing director of MIS for the Wheeler Group, a division of Pitney Bowes, Inc. in Hartford, Conn.

TIMEPLEX/UNISYS:

RESHAPING THE FUTURE OF COMMUNICATIONS NETWORKING

On November 9, Timeplex and Unisys announced an agreement whereby Unisys plans to acquire Timeplex. As a result, some things will change. Many things **WILL NOT CHANGE.**

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The Preferre

to Network and

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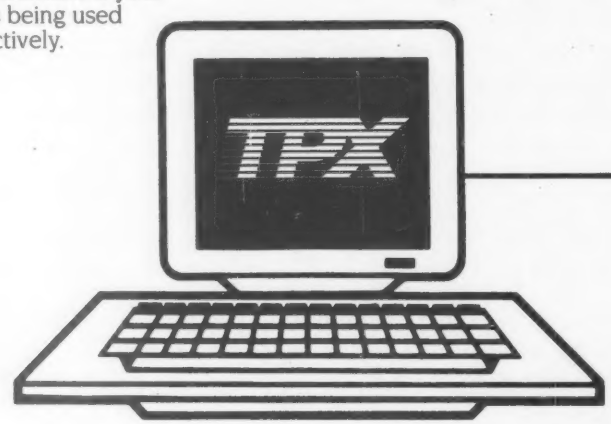

BEFORE

AFTER

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With TPX, you don't have to log off one application to switch to another. It's a full-function, VTAM-based session manager that lets you log on to many applications at the same time. You can select applications from a full-screen menu and switch from one application to another with a single command or PF key.

d Approach

Terminal Productivity

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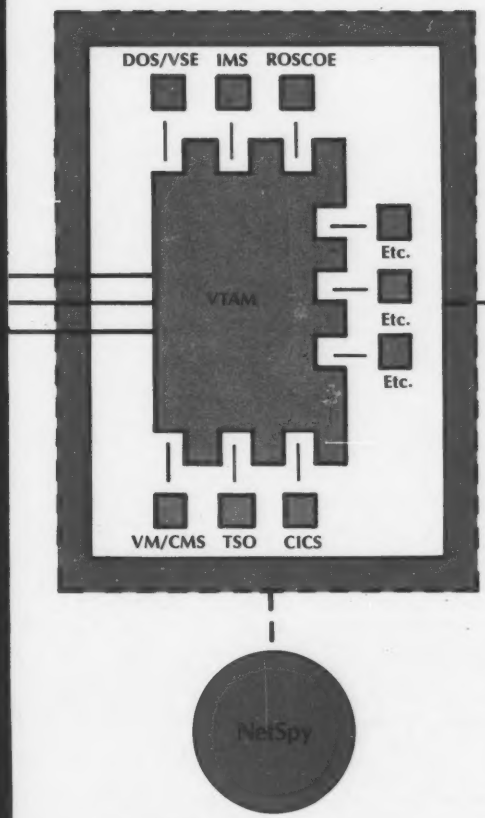

is being used most effectively. It gives you information that helps in the areas of network control, management, capacity planning, and systems programming.

When using a multiple session manager such as TPX, you can access many different applications from one terminal. NetSpy has interfaces to TPX to measure true "end-to-end" response time. This information is not available from any other source.

Communication STX
(SNA to X.25)

STX gives you easy access to many data bases on an X.25 network from a single 3270 terminal. It simplifies logon procedures, provides high speed links to the network, and automatically connects you to desired data bases. This keeps access time to a minimum and eliminates the inconvenience of using extra terminals, modems, and phone lines.

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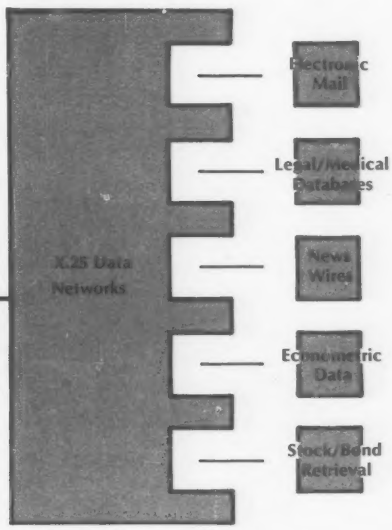

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Q AND A

John Pickens

Communications consultant says IBM's SAA is the future, pure and simple

John Pickens is the director of communications architecture at Communications Solutions, Inc. in San Jose, Calif. The company offers both consulting and software to hardware vendors that wish to integrate their products into IBM networks. In effect, Pickens is one of the people to whom the suppliers to MIS turn in an attempt to second-guess IBM.

Computerworld Focus Features Editor Michael Tucker recently spoke with Pickens on the future of IBM connectivity given the recent announcements concerning IBM's Systems Application Architecture (SAA).

How do you personally define SAA?

Relative to communications, SAA is a specification of a standard set of services, each of which has a set of standard interfaces. Those interfaces will ultimately be provided across the entire collection of IBM systems — quite literally, everything from the personal workstation to the System/36 and 38 to the 370. At the same time, SAA also is intended to imply open protocols as well as open interfaces. So vendors in a multivendor environment can have access, with IBM's support, to the IBM world with software using such protocols as LU6.2, LU2 and so on.

What is the relationship of SAA to the International Standards Organization's Open Systems Interconnect (OSI) model?

What IBM is doing with SAA is describing a set of services that will be provided by IBM across multiple environments. Now, as for OSI, IBM has recently added OSI services as one of the collections of services that shall be offered to applications programmers. That announcement has not been made yet [Editor's note: as of December 1987], but it has been discussed with consultants.

And if you looked at the SAA diagrams, you can see that both OSI services and IBM's Systems Network Architecture [SNA] services are to be available under the common SAA interface.

What this means is that IBM is clearly committed to SNA as its premier functional architecture. That will not change. But there are applications that require direct native mode access into OSI services. So IBM is handling that, first, by providing OSI-to-SNA gateways, and second, by providing native mode interfaces into OSI that can be accessed through SAA.

This, by the way, should sound familiar. We tell our consulting clients that the most effective way to gain access to SNA is to implement SNA as a native mode service in your equipment. This makes it possible for our customers to gain first-class citizenship in the services of SNA.

What IBM is doing with OSI is exactly the same thing in reverse. In fact, if I were to look forward 10 years from now, I would expect to see every computer system, whether personal computer or mainframe, running both OSI and SNA.

So the future is an equal balance between SNA and OSI?

No, not equal at all. Given the power and maturity of SNA, I think you'll see 80% to 90% of the functionality provided by SNA.

There's been a lot of talk about SAA being closed to non-IBM vendors. Is it?

To understand that, you need to build a mental diagram of SAA. Draw a block and label it "SAA." At the top of the block write "interface," and that interface is used by applications programers to utilize the services of SAA.

At the very bottom of the block is another interface, and that interface goes to the network. It's through this network interface that the SAA architectures are translated into specific protocols like LU6.2.

Now go inside that block. Draw vertical lines that divide the block into components. Label these components as LU6.2, Distributed Data Management [DDM], relational data base and the like. These vertical components are in turn linked by internal, horizontal interfaces. If we look at the horizontal interfaces between those components, we would find they are not open. They are not specified by SAA.

Indeed, they shouldn't be. The details of the interfaces are specific to the systems on which they're implemented. On a Microsoft Corp. MS-DOS machine, they might be a software interrupt, in an IBM OS/2 unit, they're a call in protected mode, and on a System/36, they are some other kind of mechanism.

But the point is, they're closed. And that's what people are usually talking about when they say that SAA is not open. The challenge for the entire industry is whether one of those central, vertical components, with its closed horizontal interfaces, could be replaced by someone's third-party product — say, by a non-IBM relational data base. And I don't have an answer to that yet.

But in my judgment, what IBM really has done is fueled the demand for networking. Even with what may be a closed environment for individual workstations at the horizontal level, there is still a significant opportunity for hardware vendors to tie in through the protocol interface at the bottom of the block.

So your clients are hardware vendors and not MIS-oriented end users?

Not entirely. I see an increasing customer base among end users. There are holes in IBM's current networking strategy. We've seen quite a lot of interest on the part of end users in doing something about [these holes].

For instance, if you look at SNA on workstations from IBM today, you'll see that it consumes large amounts of memory. [The amount is] so large that if you install SNA and put it together with the memory requirements for MS-DOS and the memory requirements of whatever compiler the applications developer is using, you'll discover that you have only 10K bytes left for application programs.

What people have come to us for is a distributed implementation of SNA in which the bulk of the SNA code is located in a dedicated SNA machine, while a much reduced — and I mean *much* reduced — layer of software is implemented on each of the workstations. This provides more room for applications. In addition, the SNA gateway is a single address on an SNA network that is shared by dozens, maybe hundreds, of workstations.

IBM's plan to solve the problem is to have 5M to 8M bytes of memory on every machine running OS/2. And two to three years from now that doubtlessly will be a very common strategy. But in the meantime, end users can still integrate their existing investments in MS-DOS-based machines via this gateway method.

Is IBM really serious about SAA? Is the company interested in distributed computing using SAA or anything else?

I think what you're referring to is the common belief that IBM is committed to selling only mainframes.

But I think that's wrong, particularly if you look at the success of the Entry Systems Division and, now, the Communications Products Division. Both of these divisions have distributed processing as a mandate. I believe that IBM is being driven to SNA, SAA and distributed computing by its customer base. End users are pushing for distributed processing.

What does SAA mean for the industry as a whole?

We are telling our clients that with SAA, IBM has laid down the gauntlet and said, "If you want to play in this game, here is what you've got to have." You need Advanced Program-to-Program Communications, LU6.2 and 3270 capabilities and LU2. You need to have Document Interchange Architecture for documentation and office automation services. You need to have SNA distribution services. You need DDM for remote file access.

We continue the story by saying that not only do you need these protocols, but you also need to be manageable as if you were a native SNA device.

In addition, we tell our clients there are certain areas that are closed, and we'd recommend staying away from them.

Such as?

In particular those areas that are in the transport network itself. We're seeing hints of closure in two places: subarea networks and communications controllers. You may recall some months ago there was a small stir created when IBM changed the status of some of its documentation for protocol elements in SNA. It moved that material from public documentation to documentation that's only available under software license. I don't consider that a major move, but I do think it's a signal.

Why is IBM starting to close the transport network?

The positive and friendly perspective is that IBM is making a major redesign and has to go through a great deal of work before it can open things up again. Or you can look at it as a competitive move and say that this is the area in which IBM is really going to make SNA networks work well, and the company doesn't want other vendors to put their products in that segment of the network architecture.

Assuming it is the latter, who are the targets?

I think it would be the vendors of communications controllers — possibly Amdahl and NCR.

What should MIS professionals know about SAA?

Well, what they really should know about are the interfaces — particularly, the LU6.2 interface — because those are what they will be using to develop new distributed applications.

Letters

Continued from page 5

Some young and inexperienced systems executives probably believe what he says because it sounds good and certainly fits with industry hype.

J. Robert Riggs
President
J. Robert Riggs Co.
Dallas

Insurance firm runs dual LU2, LU6.2 line

I read your Nov. 4, 1987 issue on micro strategies with great interest. I am concerned about the accuracy of the article titled "A cooperative effort: Sharing the processing load." The article contained the following statement: "Another problem with APPC is the way LU6.2 devices are defined in SNA. At this time, you can define a line to support either an LU6.2 device for cooperative processing or an LU2 device for IBM 3270 emulation. The line cannot support both types of devices concurrently."

This statement is not true. The American Family Insurance Group has had LU6.2 devices and LU2 devices defined and supported concurrently on the same line for about one year. The devices are IBM 5364s that have both LU6.2 applications and LU2 applications in production. While this firm is an early user of LU6.2 applications, it has found the environment to be very stable for applications requiring tight synchronization between mainframe-based and distributed data.

Byrne Chapman
MIS Technical Support Manager
American Family Insurance Group
Madison, Wis.

MIS's honor

Continued from page 6

computer users.

These are moral judgments and are highly situational. It is difficult for outsiders to make determinations. Each person must evaluate his role in the light of organizational and societal good. Is this judgmental? Yes. Is it easy to align with business goals? Yes. But if we value our profession and our status, the duty of assessing moral boundaries will be a strong factor controlling our vision of what is right. Ethics practiced individually can reinforce self-esteem. Practiced across the MIS profession, ethics have the power to ensure the technology is used benignly. And it is this shield of moral responsibility that will protect our profession from the irresponsible accusations of others.

news & analysis

UPDATE

OSI delays have helped bolster support for TCP/IP

The communications industry has produced a surprise or two recently.

Witness the ground swell around the Transmission Control Protocol/Internet Protocol (TCP/IP). This mid-level International Standards Organization (ISO) networking protocol was supposed to be temporary help, an intermediate stage before the ISO's Open Systems Interconnect (OSI) stepped in. TCP/IP has turned the tables and is proving many detractors wrong by gathering much more market support than was initially expected.

TCP/IP has found its feet through users in the government and now the commercial markets.

"I've noticed a perceived need for more intersystems connectivity," explains Chuck Newton, president of Newton-Evans Research Co. in Ellicott City, Md. "TCP/IP is providing a proven, workable link. We found much more support in the commercial area for TCP/IP than we thought existed."

Newton says TCP/IP is also getting a boost from the fact that OSI seems to be perpetually off in the distance, and he doesn't think a workable OSI model will be available in the U.S. for another 24 months.

As for the Manufacturing Automation Protocol (MAP), which is based on OSI, Newton says it is fading. MAP is still being discussed, ad infinitum, but that's just the point. There is a lot of talk but, as yet, few installations for interested customers to look to as reasons to get excited about MAP.

Not all roses

Not that everything is coming up roses for TCP/IP. The U.S. Department of Defense recently stated its intention to drop TCP/IP in favor of OSI, and Bridge Communications, Inc., a Mountain View, Calif., subsidiary of 3Com Corp., has introduced an OSI-compatible communications server that could presage the arrival of other OSI communications products on the market.

Even more significant is an announcement by Netwise, Inc. in Boulder, Colo. The company has introduced a number of tools that automatically generate OSI standards-based network software for distributed applications.

According to David Andrus, Netwise's chief executive officer, the Netwise tools can operate with several languages, such as C, Fortran and Cobol, and support OSI, MAP, Digital Equipment Corp. Decnet, IBM Systems Network Architecture and Advanced Program-to-Program Communications and TCP/IP networking protocols.

"OSI is coming, and we'll be ready," Andrus explains. "Until then, however, developers can use our tools to program in the current system environments we're supporting."

Roses have thorns

TCP/IP is also a thorn in IBM's side, according to Doane Perry, a senior telecommunications consultant at International Data Corp. (IDC), a research firm in Framingham, Mass.

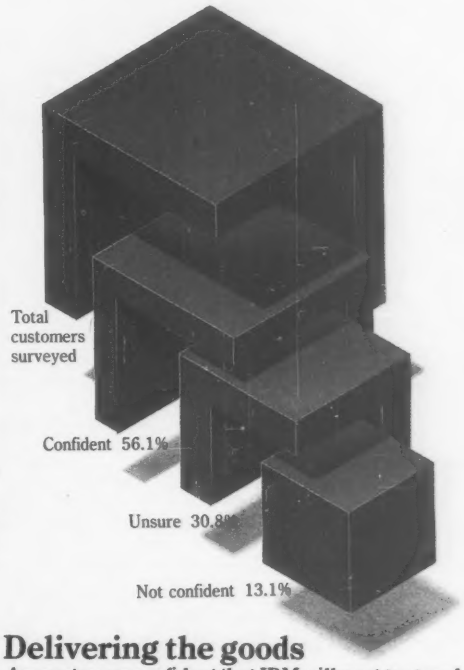
"IBM is troubled by TCP/IP because there is demand for the standard," Perry says. "On one hand, IBM can't ignore potential TCP/IP profit, but on the other, IBM would rather not be sidetracked from its current commitment to OSI and Systems Application Architecture," Perry explains.

Leaving TCP/IP, Newton says he sees a trend in the continuing proliferation of telecommunications solutions and products that have been spilling into the market and confusing the lives of U.S. telecommunications managers.

"Microprocessors are at the root of this trend," according to Newton. "Integrators are putting these processors to work in all kinds of telecommunications products, but buyers are waiting for a clear product or direction to emerge. The telecommunications market is not like the computer industry. Computer executives can always turn to IBM, but AT&T has failed to emerge as the IBM of the telecom industry."

And who benefits from this confusion in the telecom arena? User-side consultants and, hopefully, telecommunications managers, Newton says. He

Continued on page 13



Delivering the goods

Are customers confident that IBM will meet proposed delivery dates for its network products?

INFORMATION GATHERED FROM AN INTERNATIONAL DATA CORP. SURVEY OF 107 IBM SYSTEMS NETWORK ARCHITECTURE SITES.

GRAPHIC BY BRUCE SANDERS

Group formed to provide mobile satellite service

Private communications vendors, under the direction of the Federal Communications Commission, are forming a joint venture to provide mobile satellite communications services to U.S. consumers. The move is being hailed by many as a great leap forward for space-based personal communications. However, some observers fear the venture will create a new communications monopoly.

For years, people have talked about truly mobile satellite communications. A mobile satellite service (MSS) would be a system under which any land, air or sea vehicle — or even an individual carrying a pocket communications device — could link to the world via communications satellite.

The advantages of an MSS would be immense. Remote areas, no matter how far removed from civilization, would not be isolated any longer. A downed airplane pilot, a stranded motorist or a distressed hiker could simply phone for help, even if he were in the middle of Antarctica.

Technologically, an MSS has been possible for some time, but vendor disputes over communications protocols, business strategies and so forth have kept such projects on the ground. However, in 1987, the FCC stepped in to resolve the issue. It directed all serious would-be MSS vendors to form a joint venture that would collaborate on a single space-based communications service. Further, the FCC required each of the vendors to prove its financial viability by depositing $5 million into a common escrow account.

Continued on page 12

Cable-based nets get competition from unconventional LAN media. Page 13.

E-mail just isn't the same anymore

Just when you thought it was safe to send an electronic mail message to a colleague, along comes group productivity software to complicate matters. On the surface, group productivity software is difficult to categorize. The software seems to cover a lot of common ground with related products such as distributed data bases, relational data base management systems, integrated office systems and executive information systems, not to mention the more traditional E-mail systems, which focus on the bread-and-butter functions of calendaring and scheduling.

Howard Case, vice-president of marketing at Conetic Systems, Inc. in San Leandro, Calif., says the company's group productivity software, Higgins, differs from such integrated office systems as All-In-1 from Digital Equipment Corp. and Comprehensive Electronic Office from Data General Corp. in two major areas.

"Traditionally, integrated systems are minicomputer based and emphasize word processing," Case explains. "Higgins is based on personal computers and runs over a local-area network. We also give regular electronic mail functions over wide-area communications."

Case adds that Higgins is built on the company's own relational data base, which enables users to have personal data bases available on more than one server.

"I guess that's pretty close to what distributed data bases are about," Case claims. "Once [Microsoft Corp.'s] MS-DOS 3.1 and record-locking facilities became available, we could open up the networking and data base features of group productivity software."

According to Erin Zabriskie, a marketing representative at Orem, Utah-based Wordperfect Corp., whose Wordperfect Office group productivity package is scheduled for release in March 1988, Wordperfect Office is also relational in nature.

"The product's scheduler facility can take variables from users' work schedules and automatically coordinate the best times and places to arrange meetings and other events," she says.

"Wordperfect Office then sends an update message to the users involved," she adds.

User productivity

"Such group productivity software is helping people discover that linking personal computers together finally produces more user productivity," explains Molly Upton, vice-president of applied technologies at International Data Corp., a market research firm in Framingham, Mass.

"Group productivity software is different from executive information systems because it hasn't been predesigned to screen information and put it into graphics. Group productivity systems are also different from other systems because they are PC based and their target user markets are not as specifically focused," she says.

Yet Upton also argues that there will be a market convergence among group productivity software and other integrated productivity software in the future.

To increase sales and market share, both vendors of executive information systems and integrated office systems will be opening up their target user bases to the middle management area and incorporating personal computers into their products.

Middle management and PCs are already two important components found in group productivity software. One area in which group productivity software might remain distinct, however, is in its ability to service more narrowly defined work group situations among people who share common work concerns. "Most of our customers operate within work groups of 20 to 30 people," Case explains. "That's what we're targeting."

The Coordinator may signal a way in which group productivity software can carry out the work group approach.

The Coordinator is a group productivity system that runs on both Novell, Inc. LANs and much larger networks. Action Technologies, Inc., the Emeryville, Calif., developer of The Coordinator, has produced a relational type of networking software that reportedly enables users to create their own distributed data bases.

Behind the scenes, The Coordinator's software sifts through data bases to collate communicated data into categories, which Action Technologies claims can provide more meaning to users than the usual electronic mail offerings.

Yet, almost as an afterthought, the firm hastens to add that The Coordinator also provides regular E-mail calendaring and scheduling features. Apparently, there are still many users out there who prefer the more simple staple of E-mail services — SK

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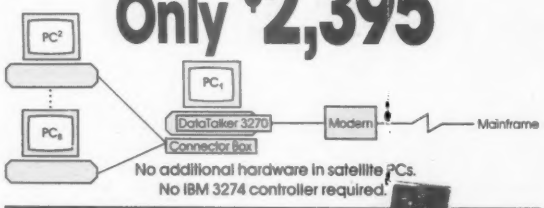

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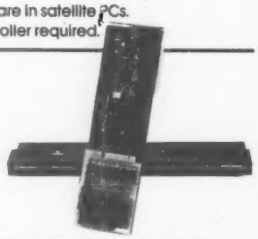

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Mobile satellite

Continued from page 11

The survivors of the latter requirement numbered only eight. The group was made up of Hughes Communications Mobile Satellite Services, Inc. in Los Angeles; Mobile Communications Corp. of America — Space Technologies Corp. in Jackson, Miss.; Mccaw Space Technologies, Inc. in Portland, Ore.; Mobile Satellite Corp. in Malvern, Pa.; North American Mobile Satellite in Washington, D.C.; Satellite Mobile Telephone Co. in New York; Skylink Corp. in Boulder, Colo.; and Transit Communications, Inc. in Pasadena, Calif.

Partners in the sky

Under FCC pressure, the eight agreed to form the MSS Consortium, which functions as a profit-making general partnership jointly owned by all the participants. The consortium will cooperate on the construction of a satellite, on its launch and on the operation of space-based services thereafter.

In November 1987, the eight announced they had reached an understanding "regarding the key principles that will govern fundamental business, structure and procurement decisions of the MSS Consortium." In other words, the group is now free to address the technical issues that continue to keep MSS from becoming reality.

Partisans of the consortium say the arrangement is the quickest, most efficient way of getting MSS functions to the consumer. But the consortium also has its critics. Some observers feel that individual vendors' services should be made competitive and that the FCC-mandated consortium has effectively created a monopoly situation. Even some of the eight members will privately admit to reservations about the arrangement. "It doesn't sound very good for the consumer," says one company officer, who asked not to be named. "We've fought for years for competitive services, but we lost that battle. So now that we've done our civic duty, we'll take the money and run."

Champions of the consortium argue that the arrangement is actually the only means by which to get space-based communications to consumers. Billy J. Parrott, president of Satellite Mobile Telephone (the only minority enterprise in the big eight), argues that the sheer costs of an MSS require that as many vendors as possible share the expenses. "The satellite has to be built, the spacecraft has to be launched. . . . We'll spend nearly $300 million even before we get the bird launched," he claims. "It's an awesome investment. What the FCC is saying is rather than one person or company making that investment, do it jointly."

Parrott compares an MSS with an interstate highway system. The government builds and maintains state highways at public expense but then allows trucking firms to compete for business using those roads. So, too, he says, will the government allow the MSS Consortium to set up the space-based system and then allow ground-based communications wholesalers outside the consortium to compete for business using the system.

"People forget that there will be two aspects of this setup," Parrott says. "The space-based consortium will be only part of it. The ground-based side of the business is where the business will be. Eventually, I suspect, the ground investment will be greater than the space investment."

But monopoly or public service, the group expects to have its satellite built by 1988 and launched by 1990. — MT

Update

Continued from page 11

adds that one fallout from the situation is a requirement for more centralized telecommunications functions.

Another elusive standard, the Integrated Services Digital Network (ISDN), is getting closer to acceptance. Despite AT&T's recent decision to hold off producing preliminary ISDN tariffs for another year and despite undelivered promises of vendors, ISDN technology should prevail.

"There's some definition about what the 1990s will bring with ISDN," Newton says. "Users are thinking about applications and pricing. Momentum is building."

IDC analyst Perry points to IBM's recent declaration that it would support at least a formal, standardized version of ISDN in the future as a solid indication that ISDN is picking up speed.

EDI heats up

One definitely hot area in communications is electronic data interchange (EDI), which Newton claims is getting more commitment from the retailing, manufacturing and distribution markets.

Despite initial technical and marketing problems with EDI, Newton says that a refinement of EDI services and a push toward standardization on the part of the Transportation Data Coordinating Committee (TDCC) and other EDI standards committees are pushing EDI ahead.

The recent creation of an international EDI users group and the American National Standards Institute's finalization of its X.12 networking standard are also expected to spur interest in EDI (see story page 39).

Storming the walls

Meanwhile, Unisys Corp.'s recent purchase of Timeplex, Inc. is being seen by many as a direct assault on IBM's network fiefdom.

Timeplex is the largest U.S. manufacturer of T1 multiplexers, and the move to purchase the company is a good way for Unisys to integrate private branch exchanges and other communications products into its expanding computer lines, according to industry watchers.

The Unisys/Timeplex marriage raises some interesting questions, however, about Timeplex's existing IBM account.

Most of Timeplex's customers use IBM mainframes, which compete directly with Unisys systems. Many of these same customers also use IBM's Netview network management system.

"It will be interesting to see if Unisys lets Timeplex service its Netview customers in the future," Perry says. "It should make for an interesting arrangement." — SK

dB

By Rich Tennant

YOU KNOW, LAST YEAR WAS QUITE A YEAR. THERE WAS THE 386 CHIP, HYPERCARD, RELATIONAL DATA BASE STANDARDS.
IN FACT, IF YOU THINK BACK TO THE ORIGINAL ENIAC, WITH ITS 18,000 VACUUM TUBES AND 70,000 RESISTORS, IT'S AMAZING HOW FAR THE TECHNOLOGY HAS COME.
LOG OFF DSC BREATH...I'VE GOT CODE TO RECOMPILE!
TO SAY NOTHING OF THE USER.
POWER USER

Wireless LANs seek to usurp cable's role

Alternative local-area networks are coming. Trying to capitalize on the expensive installation costs of traditional cable-based LANs, developers have been working on a variety of technologically diverse LAN media to catch user interest.

Solutions range from radio frequency (RF) to infrared LAN transmission, so-called wireless LANs.

Ray-Net Communication Systems, Inc., a West Vancouver, British Columbia, company that has developed Ray-Lan, an RF LAN, claims that the initial high installation costs of Ray-Net network nodes will be more than offset later when customers invariably have to reconfigure their networks.

What it's got

Ray-Lan's main components are an IBM Personal Computer adapter board, an RF transceiver that is placed near the workstation and proprietary software that is compatible with Novell, Inc.'s Advanced Netware LAN operating system.

Reconfiguring Ray-Lan simply entails placing workstations and transceivers at new locations within the distance parameters of Ray-Lan RF transmissions. This action obviates the high costs of removing and relaying computer cable, the norm in today's LAN installations, the vendor said.

Though Ray-Net insists its product will eventually find widespread use in mainstream commercial office applications, the company is initially targeting niche industrial and distribution applications in which the need for wireless applications will outweigh some of the drawbacks of RF transmission, such as slow transmission speed or line-of-sight requirements.

"I can see RF LANs in niche applications that require frequent [network node] movement," explains Brad Baldwin, an industry analyst for the Telecommunications Industry Service at Dataquest, Inc., a San Jose, Calif., market research firm.

"These would be applications in which you're possibly sending and receiving data from a moving vehicle or boat or in warehouses or heavy shop-floor situations in which laying cable could be awkward and is only temporary. I think there are still too many trade-offs with wireless LANs for the commercial area," he says.

One such trade-off is speed, or rather, lack of it. Ray-Lan's transmission speed of 19.2K bit/sec. is slow when compared with a LAN rate of 1M bit/sec. from AT&T's Starlan.

Another wireless LAN technology under development, infrared transmission, suffers from line-of-sight considerations that limit its transmission distance considerably.

"Bouncing [data] transmissions off a central point on a ceiling to workstation receivers around the office is not going to convert a lot of people to infrared," Baldwin suggests.

Problem upon problem

"Just the idea that these wireless technologies are so different from regular LAN technology is enough of a drawback," according to Lee Doyle, a senior analyst at International Data Corp., a Framingham, Mass., research firm. "The fact that there are distinct trade-offs with wireless LANs just adds to these problems."

Both Baldwin and Doyle, on the other hand, point to same-premise unshielded twisted-pair telephone wiring as a medium that offers some real relief to LAN users.

"Unshielded twisted-pair LANs offer a 10M bit/sec. Ethernet LAN transmission rate," Baldwin explains, "which is the same rate as current thin-wire Ethernet."

Unshielded twisted-pair LANs offer high bandwidth and easy reconfiguration and installation (most office buildings already have adequate unshielded twisted-pair wiring installed on their premises), although initial installation costs per node average about $500 above that of current Ethernet LAN installations.

Another limitation is the transmission distance that is technologically feasible between the network wiring closet and a workstation node. In the case of an unshielded twisted-pair LAN, that distance is currently at a maximum of approximately 300 feet, well below existing Ethernet networks' average of about 1,000 feet.

Michael Clair, vice-president of marketing and sales at Synoptics Communications, Inc., the Mountain View, Calif., developer of the Lattisnet unshielded twisted-pair LAN, claims recent studies indicate that most workstations are within 300 feet of wiring closets, so added installation costs are unnecessary.

Synoptics, whose product was introduced in August 1987, has some stiff competition. Digital Equipment Corp. introduced its unshielded twisted-pair LAN adapter in September 1987 at Decworld, and 3Com Corp. followed suit the same day with its own offering.

Hewlett-Packard Co. is scheduled to start shipping its product in July 1988, and both Wang Laboratories, Inc. and Western Digital Corp. are developing their own unshielded twisted-pair LANs. The field is getting crowded.

"We still recommend that our customers use regular coaxial cable because it gives greater transmission distances and is less affected by external interference," says Gail Daniels, a marketing manager at DEC. If they cannot use coaxial, then unshielded twisted-pair LANs can be an option.

Synoptics' Clair stresses that unshielded twisted pair is not merely a compromise technology.

'No shortcuts'

"The unshielded twisted-pair rate is 10M bit/sec. and can provide true IEEE 802.3 Ethernet networking," Clair explains. "There are no shortcuts taken here."

To emphasize the issue, Clair points to several studies recently carried out by some regional Bell holding companies as well as Novell, which pitted Lattisnet, representing unshielded twisted-pair, against some thin-wire Ethernet networks.

"There was no throughput degradation or bad data on the part of the twisted-pair," Clair claims. "In fact, in certain cases, Lattisnet outperformed the other networks." — SK

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TCP/IP alive and well — until full OSI arrives

Despite general industry agreement that the International Standards Organization's Open Systems Interconnect (OSI) model will eventually be the standard for data communications, other communications protocols — particularly the Transmission Control Protocol/Internet Protocol (TCP/IP) — refuse to die. In fact, TCP/IP, the current standard for communications in Unix systems, is still very much with us.

Indeed, in recent weeks, several firms have entered or reaffirmed their faith in the Unix-oriented protocol. Some observers suggest this trend spells trouble for the OSI model, but the majority opinion is that TCP/IP is actually functioning as a conduit to OSI.

TCP/IP is one of the oldest of the current communications protocols. It was developed along with the Unix operating system and, like Unix, was put together in a distributed fashion by independent researchers operating in many different efforts at universities and private and government research laboratories. It has had particular influence among military researchers. Today, TCP/IP is the single most common method of linking Unix-based computers, especially those Unix machines from different vendors.

Unix at the root

The key word here is Unix. Many of the same researchers and vendors who initially developed TCP/IP to span different Unix boxes are now interested in linking machines with different operating systems. Many are now involved with the OSI effort and are being assisted by computer users who demand multivendor connectivity.

The OSI model is now well defined enough that there exist several firms to sell OSI-based communications software. One such vendor is Retix Internetworking Co. in Santa Monica, Calif. "It's a myth to say that OSI is still only an architecture in formation," says Charles Criss, Retix's vice-president of sales and marketing. "Parts of it are now sufficiently firm that you can write software [based on it], as we have."

Retix currently offers not only OSI communications software but also a number of development, testing and validation tools that enable buyers to put together their own OSI-compatible applications.

Also, there is now an extensive support infrastructure for developers and MIS professionals working with OSI. Training in the protocol, for instance, can be obtained from several seminar houses. Omnicom, Inc., in Vienna, Va., recently announced a one-week series of classes titled "Omnicom Week," which promises to make MIS staff OSI literate in just five days.

Yet TCP/IP endures and prospers. TCP/IP vendors have reportedly increased in number in the last year. Meanwhile, major hardware vendors are taking every possible step to have TCP/IP in their offerings. Even Digital Equipment Corp. in Maynard, Mass. (which had been rumored to have its own standards to offer), announced last November that it had licensed the Fusion TCP/IP networking software from Network Research Corp., located in Oxnard, Calif. In fact, in recent company literature, DEC has called TCP/IP the emerging "de facto standard for interconnecting heterogeneous computer systems."

As for the TCP/IP vendors, they have so far declined to enter the OSI market. Subhash Bal, vice-president of marketing for TCP/IP vendor Excelan, Inc. in San Jose, Calif., claims his company could have an OSI product within a year. But Excelan has chosen instead to remain focused on TCP/IP and recently announced a product to extend that protocol to Microsoft Corp. MS-DOS systems.

Why the difference between the market reality of TCP/IP and the almost universal endorsement of OSI? Bal explains the situation as simply a question of timing. Like most TCP/IP vendors, he feels that OSI ultimately will win out, but right now, TCP/IP is finally becoming an industry in its own right. "People who sell OSI are almost exactly where we were several years ago," he says. "Then, people who bought TCP/IP were just experimenting. Well, today, TCP/IP is well known, and people are actually using it. OSI, meanwhile, is what they're buying as an experiment."

If that is the case, then the question for both communications buyers and vendors is how fast and when they will be asked to convert to OSI software from TCP/IP. Some vendors are suggesting that the transition may be painless. They are hoping that gradually all communications software, including that based on TCP/IP, will take on more OSI features with every release and upgrade, until, finally, there will be no difference between OSI and earlier standards. — MT

What our financial services clients will tell you about N.E.T. T1 networks:

Foes DEC, IBM take fight to net management arena

Network management seems to be emerging as the new battleground for archrivals IBM and Digital Equipment Corp. Each seems to have abandoned its attempts to dominate networking media and instead has focused on the control of data communications through network management.

However, third-party vendors could yet give the titans unexpected competition.

IBM was the first of the giants to promote network management as a fundamental business strategy; its network manager is Netview. When first introduced in 1986, Netview was a single product, but it has rapidly grown until now it is an entire group of offerings that range from mainframe-based systems to a personal computer version.

Some analysts have suggested the personal computer version is the most important of the Netview products. They suggest that it foreshadows a long-term IBM philosophy of distributed computing in which entire networks are managed from small, dedicated workstations.

Status enhanced

Netview's status was enhanced by several features announced in October. These additions included products that give network operators the power to distribute software, analyze data and transmit data files within large voice and data networks.

DEC, meanwhile, is also making an issue of network management, though the company has not grouped network management functions within a single product line.

Instead, DEC officials say that the company offers a group of different management products that can be selected or rejected according to users' needs.

DEC's detractors, however, claim that the VAX maker lacks a coherent network management product line. "If DEC doesn't come out with a Netview buster pretty damn quick, its products will end up as just another bundle of boxes on IBM's System Network Architecture," according to one user, who asked not to be named.

DEC's defenders, however, point out that the company's Decnet contains extensive network management functionality. They also cite DEC's recently announced computer-integrated telephony (CIT) program, which the company says will ultimately link DEC data networks with the voice networks of leading private branch exchange vendors.

Thus, the CIT program has the look of an embryonic Netview.

In effect, then, both firms seem to be adopting a strategy under which they assume voice and data networks will contain not only dissimilar machines but also dissimilar networking media and software.

> **"If DEC doesn't come out with a Netview buster pretty damn quick, its products will end up as just another bundle of boxes on IBM's System Network Architecture."**
>
> AN ANONYMOUS USER

Rather than attempting to impose proprietary standards on either, the companies now want only to control the management function. They seem to be operating on the philosophy that "if you can't beat 'em, manage 'em."

However, there are other options in the management business. Third-party hardware and software vendors also sense a market opportunity. Cincinnati-based Cincom Systems, Inc., for instance, is one of the many vendors to get into network management. Its Net/Master product for IBM machines is a direct competitor to Netview.

Better than IBM

Cincom's fans claim it is actually superior to the Big Blue product.

Other vendors, notably Digital Communications Associates, Inc. in Alpharetta, Ga., have called for the imposition of standards on network management so that it will be as removed from proprietary domination as networking media is today.

Thus, if DEC and IBM really are attempting to shoot it out at the management level, it may be that both will not only have to deal with each other but with snipers as well. — MT

News section written by *Computerworld Focus* staff members Stan Kolodziej and Michael Tucker.

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A direct connection to productivity

BY PAUL STRASSMANN

Connectivity and productivity are tied more closely than many organizations realize. Communications and connectivity technologies have the dangerous potential to increase the complexities of managing people and systems thus increasing costs and delaying productivity gains. To avoid these difficulties, managers need to simplify business procedures and carefully assess the technology from a human standpoint.

Numerous studies corroborate that management communications (overhead) is the single largest cost factor in U.S. businesses. The costs of management communications, especially for such things as company meetings, exceed the expenses for direct labor and for the used cost of capital in most cases. In the average U.S. firm, management studies indicate, the total cost of management communications currently exceeds net profits by a factor of three to five. Excessive costs of administration, coordination and innovation not only detract from profits but also cause inadequate competitive responses.

What is at the root of these self-inflicted injuries, and how can they be avoided? And what is the role of information technology to alleviate the symptoms of cumbersome decision making?

Even though electronic mail, computerized scheduling, on-line simulation of pricing decisions and easy connectivity to distributed data bases could reduce delays and excessive costs, the sad truth is there are too many circumstances involved for companies to take advantage of all of these features and deliver much-improved results.

Account for human factors in your goals

In examining a broad spectrum of management practices, one often wonders why it should take so much time and money to accomplish goals. For example, a modification of pricing policies is one situation that can be cumbersome, consultation intensive and time consuming. I have observed similar patterns in product development, in deciding on plant location, in reorganizing, in budgeting and in major project proposals.

I recently reviewed a project in which 150 hours of coding and testing called for the completion of elaborate phase-program management procedures, a demand that required an additional 900 hours worth of proposals, feasibility studies, checkpoint reviews, audit sign-offs and installation verification efforts.

After adding all of the communications time for coordination and consultation on this much grander scale, it's no wonder why some projects can legitimately end up with $800 toilet seats, $1,700 wrenches and $650 coffee pots.

To explain how connectivity relates to productivity, I will extend the scope of the seven layers of the International Standards Organization's (ISO) Open Systems Interconnect (OSI) to include all the means by which management communicates. If the objective of OSI protocols is to achieve smooth electronic network transparency, I will now classify the managerial communications processes in similar terms that smooth the transparency of verbal and written communications.

In one pricing policy case (see story page 18), 99% of the costs were not incurred from making changes to the billing programs to reflect what management wanted. Rather, more than $70,000 was spent on meetings either to arrive at the pricing decision or to communicate it.

Strassmann retired from Xerox Corp. in 1985. His career in computers began in 1954 and includes 20 years as a chief computer executive and seven years as vice-president of strategic planning. His 1985 book, *Information Payoff*, has received worldwide acclaim, and its sequel, *Computer Payoff — The Business Value of Information Technology*, will be published this year.

DAVID FLAHERTY

Top management's decision time was negligible. Phone conversations were about 10% of the cost; systems analysis and programming about 10%; text creation, editing and printing less than 10%. Theory would then dictate that the process was only 1% cost-efficient because only a decision by top management and a change to the pricing tables were absolutely essential. By similar reasoning, the entire process was only 3% efficient in scheduling if one presumes the company president directly activates an expert system.

What, then, consumes 99% of costs and 97% of the schedule? The culprit is the lack of connectivity in management communications.

When I examine what was said at management meetings, transcripts of phone calls, electronic mail messages, memoranda and intracompany bulletins, they rarely make any sense taken in isolation. These channels of information are repetitious, loaded with extraneous data and incomplete. Managerial conversations make sense only to someone who can decode them based on a familiarity with the corporate culture.

The network equivalent of this phenomenon is the elaborate de-encryption protocols that are present in defense intelligence networks. Experienced corporate staff members reveal the presence of such routines when they explain their conclusions by referring to their company's method of operating, claiming, "That's the way we do things here."

In addition to the presence of company-specific or function-specific codes, such as MIS or accounting jargon, I find that organizational connectivity is further confounded by the presence of a large number of messages that are either parochial, contradictory or ambiguous. Confronted with such a system design, organizations can survive only by interposing into their networks costly compensatory protocol conversion processes (staff meetings), error correction routines (requests for departmental comments) or noise suppression devices (executive directives).

Company chaos

Each company laboriously formulates forms, methods, procedures, approval signatures, field bulletins and fine print on invoices to create some order through standardization in this noisy setup.

In contrast with communications standards promulgated by the Consultative Committee on International Telephony and Telegraphy, the American National Standards Institute and the like, corporate standards makers are also standards enforcers and standards beneficiaries in terms of the power they wield in dictating how decisions are made.

This situation is why corporate standards need to be continually negotiated and redefined via time-consuming message exchanges. The difficulty is to find effective communications designs, even when organizational costs dominate and when connectivity occurs only after overcoming information transmission barriers.

How can we deal, then, with the question of a comprehensive communications design that will include not only electronic technology connectivity, defined by the layered model of OSI protocols, but also organizational connectivity, defined as the decoding of the personal filters that have a decisive effect on the overall performance of management systems?

I propose that network analysts interested in designing productive management systems must also consider designing three additional layers of protocols that are incremental to the seven OSI technology layers. These added layers are organizational connectivity protocols. Level 8 would consist of individual knowledge gaining, Level 9 would deal with group cooperation, and Level 10 would pertain to enterprise goal setting.

• **Individual knowledge gaining.** Much of the time consumed by people in conversation is taken up by the exploration of relationships between new and old information. In terms of systems analysis, this process is one of pattern matching in which any new information is fitted in as a modification to existing knowledge.

In this sense, the meaning of connectivity is the ease with which someone can accomplish such a fit. It follows, therefore, that productivity is the measure of how one evaluates the costs of knowledge acquisition.

Most of us have little understanding of how unstructured management information can be organized for easy understanding. Typically, information presented to management is unbalanced in content and format. For instance, a pricing policy proposal contains precise data about revenue, legal aspects and implementation methods but lacks insights into competitor response, sales force motivation and administrative difficulties. When a pricing policy revision is proposed, each manager from various departments, such as legal, MIS, marketing, product planning and so on, will wish to find out whether the proposal disrupts existing relationships.

Because each department's interests are different and each person assigned to the review has a unique backround and expertise, there is no way of constructing a proposal that would anticipate all of the questions. Consequently, even the most carefully prepared management proposal will be unsatisfactory and consume a disproportionate amount of time placating unexpected yet potentially critical points of view.

A new way to organize

To improve the productivity of the existing management decision processes, companies must change the way knowledge is organized for communication. The current approach is becoming increasingly unaffordable; it relies on an author to predefine a tightly articulated proposition for a diverse audience. This method invariably triggers discussions, comments, replies and revisions because the proponent of an idea cannot anticipate the needs of every reader or listener.

Companies can realize a great improvement in the current originator-driven communications approach when they recognize that the knowlege-gaining needs of individuals differ in content, format and scope.

Instead of delivering precooked and predigested communications, future connectivity will have to recognize that all readers and listeners are unique and reveal their concerns only through interaction with the source of an idea.

As a solution, I see a reorientation in companies from originator-oriented to acquirer-oriented connectivity. Readers and listeners will create their own texts and scripts from organized idea elements provided by the authors. The new formats will look more like reuseable software code or program subroutines than a tablet with sentences engraved in it.

Much of the current thinking, which concentrates on this associative representation of data, is embodied in software packages such as Owl International, Inc.'s Guide, Apple Computer, Inc.'s Hypercard and Xerox Corp.'s Notecards. These products use new ways for knowledge representation to help organize ideas for management.

New standards are emerging that will specify the software environment for the sharing of ideas, concepts and assumptions so managers can add information to their own store of knowledge in ways that current, formless communications do not allow.

These formats will describe what I designate as the eighth level of communications. In this way, connectivity can be extended to include an individual's accumulated personal experience as

Ineffective communications wreak havoc on pricing policy

EXAMINING THE STEPS a computer manufacturer took to make a minor change in pricing policy illustrates the relationship between productivity and connectivity. The procedure went as follows:

• **Step 1.** Staff meeting to discuss a proposal by finance to revise pricing (Elapsed time: 4 days; Hours used: 32; Phone calls: 60; Copies: 200).

• **Step 2.** Agreement to draft a proposed policy revision. Appointment of a working group (Elapsed time: 7 days; Hours used: 8; Phone calls: 6; Copies: 30).

• **Step 3.** Actual work on policy revision (Elapsed time: 4 days; Hours used: 21; Phone calls: 25; Copies: 60).

• **Step 4.** Draft distributed for review (Elapsed time: 2 days; Hours used: 40; Phone calls: 10; Copies: 400).

• **Step 5.** Redistribution of draft for review within various functional organizations (Elapsed time: 13 days; Hours used: 220; Phone calls: 130; Copies: 540).

• **Step 6.** Coordination of staff comments, including reconciliation of opposing views and clarification of intent (Elapsed time: 2 days; Hours used: 25; Phone calls: 20; Copies: 40).

• **Step 7.** Meetings to review consolidated staff comments (Elapsed time: 7 days; Hours used: 18; Phone calls: 60; Copies: 360).

• **Step 8.** Release of summary recommendations for management approval (Elapsed time: 2 days; Hours used: 11; Phone calls: 4; Copies: 100).

• **Step 9.** Management approval (Elapsed time: 1 day; Hours used: 5; Phone calls: 2; Copies: 25).

• **Step 10.** Administrative implementation begun, including negotiation with systems and programming to process changes (Elapsed time: 30 days; Hours used: 65; Phone calls: 110; Copies: 680).

• **Step 11.** Policy distributed (Elapsed time: 42 days; Hours used: 1,020; Phone calls: 270; Copies: 7,600).

• **Step 12.** Systems implementation, including field briefing and revisions to control system (Elapsed time: 15 days; Hours used: 600; Phone calls: 122; Copies: 620).

The above case is a fairly typical corporate scenario that involves a great deal of coordination. The entire process, in terms of its connectivity events, can be presented graphically in the form of a flow chart, because all activities required verbal or written exchanges either in meetings, in print, by phone or via electronic mail.

The entire process had a total elapsed time of 129 days, cost well more than $100,000 and proved ineffective because the long lead time eliminated about one-third of the potential profits available from the pricing change.

The two critical variables: schedule and administrative costs.

As long as management tolerates and even promotes ineffective communications processes when conducting business, the outcome of projects will be predictable — high costs and low levels of efficiency. — PAUL STRASSMANN

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an essential element in knowledge transmission.

• **Group cooperation.** The word "communication" is derived from the Latin *communis*, or sharing. Therefore, even if a person can overcome an individual's limitations in understanding a message, he still must reach an agreement that will result in improved productivity.

Much of the time that was spent by managers on the pricing policy change involved negotiation of priorities. All hierarchical organizations must allow for costs (also known euphemistically as "management coordination") such as the price of expertise and specialization. The problem is that if the experts do not connect well in their efforts to harmonize action, the productivity of the entire coordinative process will degrade.

The more experts that are necessary to conclude a project, the greater the arithmetic probability of disharmony. Theoretically, there are six combinations in which four experts can disagree. By increasing the number of experts to five, the opportunity for differences of opinion rises to 24. If a person needs to run an idea by more than 10 groups, the probability of reaching a low-cost agreement vanishes.

Enter expert systems

How does a company balance the need for expertise in an increasingly interrelated world and the necessity to reduce the costs of cooperation? Decentralization is one answer, except that it creates costs through increased dependence on suppliers and on distribution intermediaries. Information networks offer a solution out of this coordination dilemma. Much of the existing procedural know-how can be placed into computers in the form of expert rules.

The result of installing expert systems will be to cut down on the number of times specialists are involved in decisions. Network-resident, rule-based applications will be accessible without the overhead of meetings, memoranda, reviews and presentations and will account for a gradually rising share of man-hours. Only unresolved differences and exceptions will thus warrant the investment of costly "management coordination" time.

I see the emergence of network-based expert servers, constructed either for intracompany needs or available on an industrywide basis, as a professional services business. For easy access to such expert servers and for smooth integration of the results produced by diverse rule-based systems, there will have to be new standards so that a broad spectrum of expert services can interact within a decision maker's personal workstation. These standards define the ninth level of communications. In this way, the concept of connectivity can include the sharing of accumulated group experiences.

• **Enterprise goal setting.** An article that discusses the relationship between productivity and connectivity would be incomplete without addressing the issue of how even the most efficient network-based organization, managed by the smartest computer-aided executives, can fail.

A pricing policy approval process based on knowledge-sharing and expert rules that delivers results at a fraction of the current cost seems to be the answer to any company's needs; nevertheless, there still may be some doubt as to whether the setup will alienate customers or aid competitors. The concept of effective connectivity is incomplete until a company provides for a means by which to confirm that its managers have dealt with the environment outside their examination of intraorganizational matters.

Layer 10, which I designate as the external connectivity protocol, must be present at all times, automatically searching for threats and opportunities not anticipated by any of my internal compulsions to secure seamless and transparent communications.

How does a company construct such a system? How does the company acquire sufficient inputs to operate such a system? And how does the company communicate its findings to administrative management, whose purpose it is to maintain predictability, consistency and stability rather than responsiveness to external disturbances? The answers to these questions are not easy, even though there exist a few hints of how such systems could be designed.

For instance, automated supermarket checkout computers are used to collect information about the movements and shifting market shares of grocery products. In another case, a telecommunications company uses a monitoring system to evaluate the decisions of lost and gained customers. This system serves as a sensitive indicator of customer reactions to various levels of service. On a much grander scale, The Strategic Planning Institute in Cambridge, Mass., has developed diagnostic methods for competitive benchmarking of business performance.

Sophisticated sources

As a broad range of market intelligence and competitive diagnostic services becomes available, this information will have to be easily accessible as an integral element of each firm's MIS department. The presence of internally and externally generated sources of intelligence will call for standardization of knowledge assessments so that management can cope with enormous amounts of totally unpredictable inputs. The network designs serving such needs will bear a resemblance to today's advanced military command and control systems.

The standards that will permit an automated evaluation of diverse sources of external intelligence define the tenth level of communications. By this means, the concept of connectivity has been extended beyond the conventionally accepted technical definitions as a prerequisite for supporting managers who are concerned with the viability of the long-term goals of their firm.

The present definitions of electronic network connectivity can continue to be viewed primarily as a technological matter, even though some vendors tend to obscure the purpose of these efforts.

In examining the bond between productivity and connectivity, I had to explore what lies beyond the technological issues. The fact is that even if all the costs of information handling are fully accounted for, the costs of technology will be always dwarfed by organizational costs.

This brings me to the key question: Is there a valid relationship between productivity and connectivity? The reply is an emphatic yes. The enhancement of individual knowledge, of group cooperation and of enterprise goal monitoring are all dependent on the adoption of computer-based forms for conveying information for managerial uses.

After the full implementation of the OSI protocol is safely set on its course to secure fluent machine-to-machine links, companies will finally start designing the connectivity that delivers the only productivity that matters — people-to-people links. ❖

Getting the terms straight

HOW CAN WE DEFINE productivity and connectivity? There is a difference in how one calculates the productivity of machine tools as compared with computers. Machines have measurable output; their productivity is the ratio of the quantity of output divided by the quantity of input. Such arithmetic simplicity is possible because the value of the output is close to its cost. When computers are used as a production machine, such as in the printing of invoices, the simple I/O definition applies.

In cases involving connectivity, however, information technology is used as a communications channel to convey information to people. The cost of such a connection is about $3 to $7 per hour for intersite transmissions, and about 20 cents to 90 cents per hour for local networks. Including allocated expenses, the full cost of managerial, professional and administrative people is anywhere from $40 to $200 per hour. There is always an expectation that the value of the transmitted information would be a multiple of the total cost of a connection.

This great disparity between the costs of a communications technology and its total use value leads to the conclusion that the productivity of conveying information can be measured only by observing the effectiveness of the recipients of the information. Measuring the physical output, such as transaction counts, is not relevant as a measure of productivity.

The definition of productivity requires the measurement of organizational performance. The technical questions of signaling frequencies, protocol formats and interface conventions are important but influence only the costs of technology rather than its value. But how can we define connectivity? Technical connectivity issues of interest to communications standards groups, such as the Ethernet interfaces or peer-to-peer file access under IBM's Systems Network Architecture, are challenging but secondary to the more key concern of whether a recipient understands what the sender is saying.

The total cost of communications, in any business, is five to 20 times greater than the expenses for computers and telecommunications. To evaluate the effectiveness of total costs, I make a distinction between the costs of people and technology involved in management information and the costs applied to operations information.

Operations information is an integral part of the costs of a product or service, such as order entry transactions, airline reservations or the completion of financial trades. Connectivity, necessary to secure operational effectiveness, is well understood. From an executive standpoint, the purposes and affordability of operational information systems are clear. Investments can be justified against clearly defined productivity objectives. Evaluating whether the connectivity is effective is accomplished by comparison against planned targets.

The problem with this setup is that applications concerned with operational systems may represent only 20% to 60% of the total information technology budget. Businesses allocate large shares of their resources in support of management information needs, including accounting, control, personnel, sales, production, research and development and other applications.

Information technology is applied here to assist management in sustaining the organization in its innovation, coordination, motivation and administration tasks. These functions can be seen as the required countermeasure to the tendency of all organizations to revert to disorder.

I define connectivity, therefore, as the capacity of the electronic medium to assist management in keeping a business organized. In this sense, the missions of management, organization and communications are identical. After all, management processes are primarily a communications activity for preventing the forces of entropy and disorder from taking over. — PAUL STRASSMANN

Strategy, not technology

Survey finds MIS stresses critical business goals

BY MICHAEL TUCKER

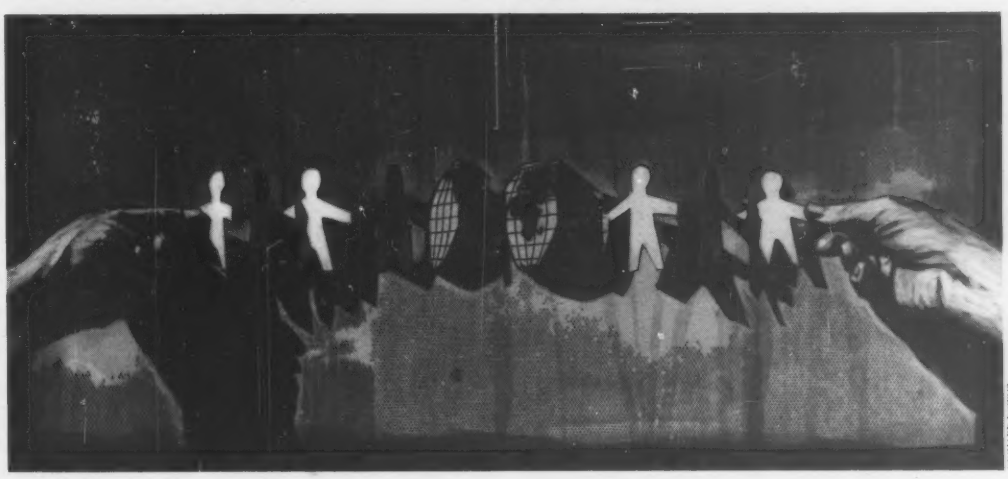
Bombarded by a seemingly endless barrage of communications products, a number of MIS and telecom users and managers say they want to turn their focus from the technology itself to the application of that technology to gain a strategic advantage. As end-user systems grow more powerful, *Computerworld Focus* has learned, the drive to achieve a strategic advantage seems to intensify proportionately within information systems management.

A recent survey of MIS and telecom professionals by *Focus* found that the group as a whole was looking for solutions. Those interviewed vented their frustrations about new and promised offerings and expressed their views on new applications of old technologies, new vendors in the business, government regulations, competing standards and the continuing flux in the communications industry.

Those managers surveyed were all over the map, both geographically and technically. Some people had investments in communications no more sophisticated than a simple twisted-pair line to a mainframe; others were looking for real-time operations in networks that span the globe.

Yet despite these differences, their comments did reveal a few common themes. For instance, all those questioned were concerned less by technology and more by the problems of integrating technology into their organizations to handle existing problems, preferably at an affordable price. "It's like the operating system," said one respondent, who asked not to be named. "I don't give a damn about whether it's MVS or VM or Unix or whatever. It's applications I need. I want something I can buy today that will actually handle my problems. As for all this stuff about X.25 and T1 and SNA . . . God! That just makes me tired."

Tucker is *Computerworld Focus*'s features editor.



RICHARD DOWNS

Moreover, all the respondents hinted that their communications desires reflected a single distant objective. To each, communications is only a means to the end of providing a strategic advantage for his corporation.

Indeed, each was concerned with extending his corporate mainframe downward to end users' desktops sometime in the remote future.

Many of the respondents said they felt that their central issue was meeting data communications requirements while at the same time staying within budget. Cost was, in fact, the single most cited concern.

When questioned about technological issues, Gary Ho, director of data communications for Los Angeles-based Transamerica Information Services, said, "Right now, our biggest concern isn't technology but cost. Our hottest button is keeping the price down. But then, that's everybody's hot button."

To each respondent, communications is only a means to the end of providing a strategic advantage for his corporation.

It certainly is for Dave Docken, senior systems analyst for the Colorado Bureau of Investigation in Denver. "For our purposes," he explained, "the biggest issue is still line costs. We're not a big network, but those costs are what kill us, particularly when we have to link between AT&T and one of the services provided by carriers."

One MIS and communications manager, who asked not to be named, was even more forceful in stating his case. His firm had just decided to go with IBM's Systems Network Architecture (SNA) as its dominant environment. "SNA is a ghoul," he claimed. "It just chews up so much money, so much manpower, so much everything, . . . and it really doesn't let you talk across different vendors' boxes. It just sits there and swallows your budget for pretty well nothing in return."

Beyond budgetary concerns, some respondents reported that the sheer capacity of their systems was their most pressing need. "Transmission speed isn't much of an issue to us," said Don Harmon, manager of communications services for Otter Tail Power Co. in Fergus Falls, Minn. "The thing that I could use the most is more capacity. I have only one line, and when that goes down, we have to rely on public phone lines."

Harmon also wishes for improved technology. For instance, he would like to have an increased ability to manage his network, but mostly he seeks "nothing too exotic — just capacity and reliability rather than technology."

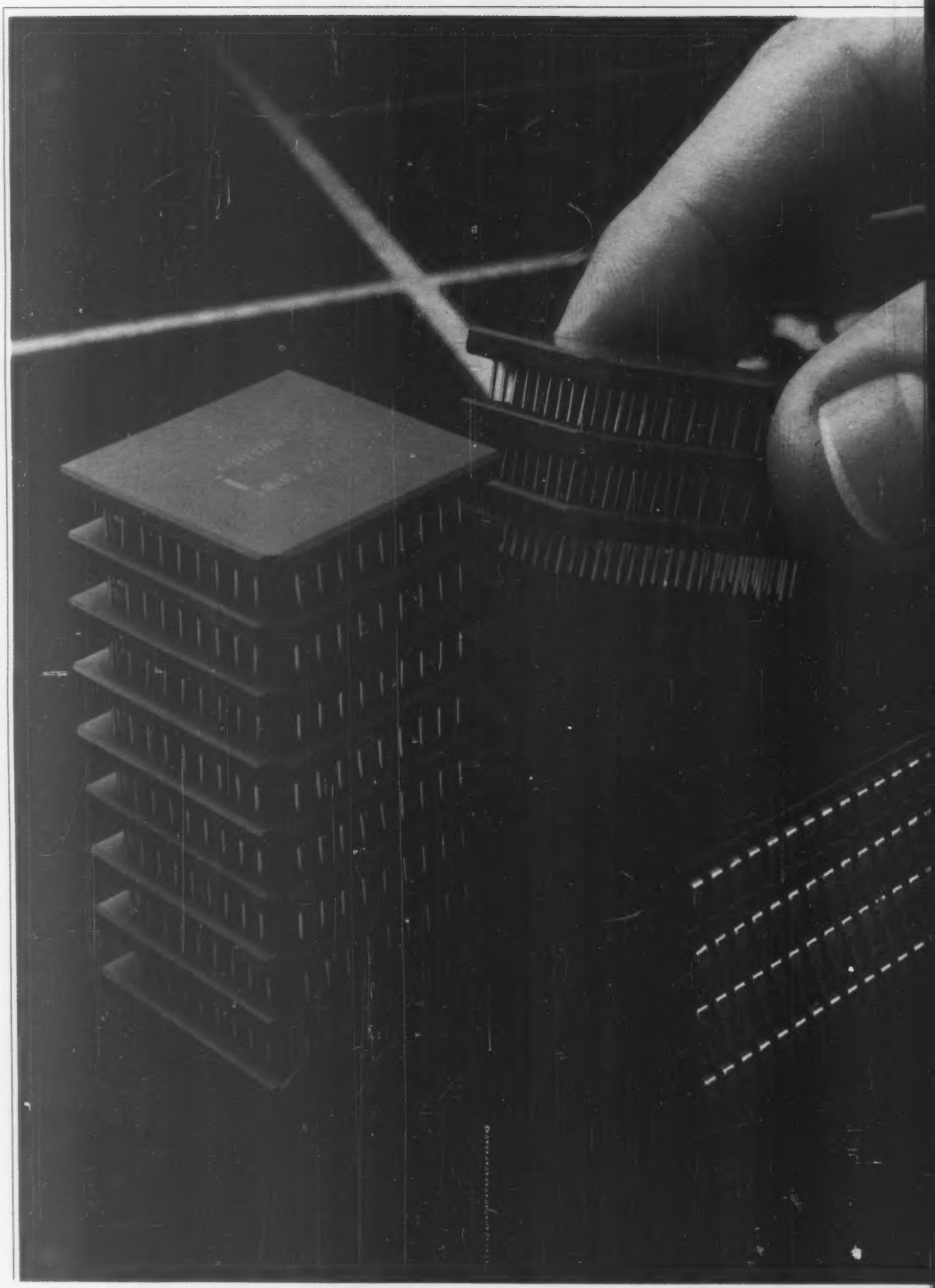
Budgetary concerns and the desire to have upper management provide more transmission capacity are both part of what might be called the "social issues" of data communications. Indeed, the datacom people surveyed cited the issue of matching corporate data communications technology with corporate culture almost as often as they did cost.

One manager of telecommunications for a large insurance company, who agreed to talk to *Focus* only under the condition he not be named, said his company is currently considering major purchases to upgrade its datacom capacity.

Cultural concerns

The manager said that his biggest concerns were purely cultural. "The question for us is how to prepare ourselves for networks," he said. "We've had some experience with local-area networks, and our users seem to understand the value of LANs. Now the problem is how to fit a LAN into the greater setting of the company. What's the term? How do we use [LANs] to gain a 'strategic advantage?' "

Gaining a strategic advantage with information systems is also a concern of Lee Co. in Shawnee



Mission, Kan., a clothing maker perhaps best known for its Lee brand jeans. The firm inhabits a volatile market in which customers are frequently young and fickle, competition is fierce and success is ever threatened by rapid changes in areas as diverse as fashion trends and tariff restrictions on textile imports.

"The biggest concern for us is dealing with our customers and vendors," said Patrick Powers, datacom manager for Lee. He explained that his company has just begun to get into the SNA environment. "We've got about 16 lines to let us talk, mainframe to mainframe, with our suppliers and customers."

He also stressed cost as one of his major worries. The network "has some interesting advantages. It's a shortcut around a lot of problems, but with the cost of all that upgrade equipment and the training that goes along with it, you can't call it a money saver," Powers claimed.

But ultimately, Powers' biggest worry is making Lee more competitive in a cutthroat industry in which every bit of information must be used to gain some sort of advantage.

Not technophiles

"We're not doing this because we love the technology. And we're not doing anything new. We're doing it to keep up with the competition," he said. In effect, the network allows Lee to practice a variant of just-in-time manufacturing under which the firm can vastly reduce the time and effort it takes to order raw materials or fill orders.

Powers noted that gaining a strategic advantage is not easy, even in terms of merely establishing the necessary data links. "I find it exciting to be able to talk to all our customers and vendors mainframe to mainframe," he said. "But it's work. It'll take a year, at least. We've got more than 130 customers and suppliers on the network, and by the time we get them all up, that year will be gone."

The search for a strategic advantage was the subtext of virtually all the respondents' answers. It was particularly apparent among those MIS officers whose end users work with systems more powerful than a common PC.

Indeed, there was almost a direct relationship: The more powerful the end-user system, the more that strategic advantage became a driving MIS issue.

Solution nailed down

For instance, Miami-based Gang Nail Systems, Inc., a company that manufactures and sells connector plates, the steel plates that builders use to link wooden beams in large wooden roofs, has an extensive network linking the company to its customers.

Yet when asked what he wanted for communications, William Moore, the firm's manager of computer services, said, "Other than making it go away entirely? . . . That's exactly what we're trying to do — we are trying to make it all go away."

According to Moore, Gang Nail "makes its money in its steel. But we also have some computer-aided design [CAD] programs that buyers can use to do their designs. You see, you can't give the steel plates away if the customers don't know how to use them."

But buyers often found that designing large wooden structures wasn't easy. Until recently, Gang Nail's design programs ran on the company's mainframe, which customers could dial up via a modem to access the software. This capability meant that Gang Nail had to maintain what amounted to an entire dial-up information service.

Moore's dedicated campaign to limit data communications used the micro as its weapon. "We're getting more and more powerful machines at lower and lower costs," he explained. "Now there are micros powerful enough to run our CAD programs."

In particular, Gang Nail is fond of Sun Microsystems, Inc. workstations. As a result of this preference, Moore noted, "We became a Sun OEM, and we sell the machines to our customers pretty inexpensively." Now, instead of dialing into Gang Nail's

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"The ISDN network we're building today will allow us to integrate voice and data, not only in our T1 network, but also in our digital switches right to the desk, and extend switched data routes to the computer host," he added.

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mainframe to run the company's software, customers obtain the software and run it directly at their own sites.

They still access Gang Nail's machines for some additional technical information, but traffic on the company's network is "down to a tenth of what it was before," he claimed.

Economics of the situation

Just like other sites, at Gang Nail the issues are not technological but economic. "The limiting factor for us," Moore said, "is cost. Some of Sun's customers are pushing them for higher performance. But for us, 2 million instructions per second [MIPS] to 4 MIPS is just fine. Now, if we could just drive the price a little further down, we'd be happy."

Meanwhile, strategic systems in the purest sense of the term can be found at the U.S. Defense Communications Agency in Washington, D.C. Ernest C. Smith, assistant deputy director for computing at the Joint Data Systems Support Center, said that, for his agency, datacom is not so much an issue in itself as it is "the vehicle by which we link different sites."

He noted that most of his problems are not much different from those of any other DP professional. "There's the normal round of problems we've all got to solve — especially security problems, because most of what we do is classified. In particular, we'd like to have different levels of security in the same environment, but it doesn't seem possible to get that from vendors," Smith explained.

Where his needs differ from those of other MIS managers surveyed is in speed. His systems need to be able to get information from one side of the globe to the other and back again in real time.

The center's task is to give civilian and military authorities the power to react instantly to any worldwide development. It must be able gather data from anywhere — even if that spot is an active war zone — flash it back to Washington, combine it with supporting information from a hundred different data bases, present it in a style that is most useful to decision makers and then carry their judgments back to commanders in the field at more than a thousand different locations. And the center must accomplish all this while keeping the information free of errors and secure from the attentions of unfriendly powers.

As daunting as this mission might seem, Smith did not say he feels the task is greatly removed from existing technology. According to him, the far bigger problem lies in the corporate culture of the user organizations. "The technology is out there," Smith said. "It's just a question of getting it into our environment. And the process of doing that seems to get longer every day."

At first glance, Smith's communications requirements seem removed from the needs of mainstream MIS. That perception is to be expected, given the unique nature of his business. Few other DP professionals are called upon to assist executives in managing war and peace.

Yet there is more in common between the Defense Communications Agency and corporate telecommunications than one might think. Increasingly, large companies are global in scope, and their executives must operate in real time on the same level. The datacom requirements of, say, an international securities or currency trader are every bit as extreme as those of a battlefield commander.

Moreover, analysts such as Shaku Atre of Atre International Consultants, Inc. in Rye, N.Y., and Michael Packer of The Mac Group, Inc. in Cambridge, Mass., have suggested that the everyday corporate computing requirements of the average frontline business manager will be as demanding as those of the international trader or battle commander.

The analysts predict that, increasingly, these people will need not isolated PCs but rather executive information systems that can pull up corporate data from any one of a dozen different locations, perform meaningful synthesis and analysis of that data, present it to the managers in an understandable style, convey those managers' decisions to field operations and perform it all in real time.

Between two eras

In short, then, what datacom professionals seem to be saying is that their communications wants are now balanced on the edge between two eras — that time embodied by the traditional MIS role and that time embodied by a newer position, which might be called the management of *strategic* information systems.

As such, the managers' main concerns have more to do with the culture than the technology of their organizations. They are being called to balance social factors, such as cost and end-user requirements, with long-term business needs.

Such an assignment calls for skills quite different from those that MIS and datacom managers have traditionally possessed. It requires that data communications professionals be able to communicate as much with individuals within their companies as with machines. They have to have the marketing skills of a consultant — or a missionary.

Those skills aren't easy to come by. Marvin Liebow, the director of telecommunications at Washington, D.C.-based Amtrak National Railroad Passengers, Inc., put it bluntly: "The problem with communications is in justifying its cost. It's the same problem that you have with justifying the cost of an interstate highway. You can't do so until it's built, and [by then,] you've got traffic on it." ❖

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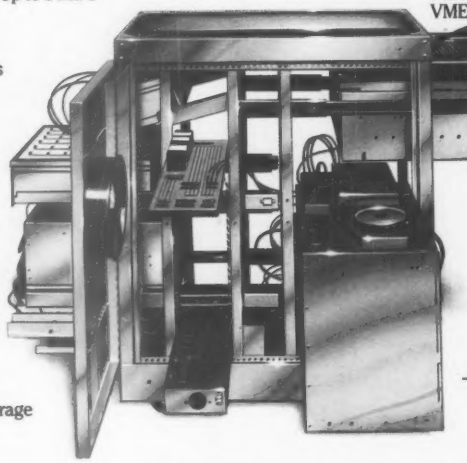

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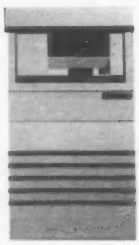

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GRAPE O'CONNELL

When it's time for the LAN man

BY STAN KOLODZIEJ
SENIOR EDITOR

"I recently visited a client who was moving into a new office building and also having a local-area network put in. During the following days, I watched the progress of the various contractors, the builders, the electricians, the plumbers and the LAN technicians.

"The LAN people by far had the most problems. What I quickly saw was how the other contractors were better trained to anticipate problems and more skilled at working together. The LAN installation was anything but smooth. In fact, it was a nightmare."

Jim Weber, president of Insight Technology, Inc., a consulting service in Piscataway, N.J., claims that during the course of his job, he sees many scenarios similar to the one he describes above.

In fact, as an increasing number of LANs and larger networks are installed in corporations, companies expect the level of expertise required to install and maintain them to also be on the rise. The problem, many user corporations say, is that LAN vendors and value-added resellers (VAR) have failed to keep up.

"I think many companies are disappointed with the existing level of service from network vendors and VARs," Weber says.

"There has been a sharp increase in the past few years in the number of companies that have gained experience and skill in having their first LANs installed. These companies have either installed their own LANs or watched their LANs being put in. Either way, they have become more critical. Many of these companies now feel they have reached the stage at which they can take the experience and try to install networks themselves."

Find out what the OS/2 LAN Server means to you. Story begins on page 33.

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Circle Reader Service Number 14

As networking becomes a big business and a vital part of corporate competitive strategies, the ability of firms to find adequate outside installation and maintenance help will become a growing concern. Linda O'Keefe, a director of the Office Systems Industry Service at Dataquest, Inc., a San Jose, Calif., research firm, goes so far as to predict that the servicing of corporate networks will become one of the key computer issues in the next decade.

A recent study by The Ledgeway Group, a Lexington, Mass.-based research firm, points out some network findings that could serve as signposts pointing to the 1990s.

Using results tabulated from nearly 1,000 corporations, The Ledgeway Group found that, in 1987, nearly 70% of the respondents' networks were installed by in-house staff and only 30% by outside vendors and dealers. That is a big turnaround from 1986. In that year, Ledgeway tabulated, in-house staff installed about 40% of networks, and outside installers put in nearly 60%. The studies covered corporate voice and data networks as well as LANs.

It's mine, leave it alone

"It appears that there might be a possession factor at work," says Rod Brown, a vice-president at Ledgeway. "Once users get networks installed, they might not want to give them over to outside help."

Michael Goulde, a senior analyst at The Yankee Group in Boston, agrees that despite the fact that networks are tough products to install, requiring a good deal of integration of wires, adapters, software and the like, there is a steady rise in the number of corporations doing in-house installations.

"I think that situation is being stimulated somewhat by the fact that many value-added resellers don't have the expertise to handle LAN installations," Goulde explains. "VARs are adding vertical software applications to LANs and are offering network management training, but they are still restricted by resources in what they can do with LAN installations.

"Installing LANs is not like installing personal computers. It's a big job, and LAN vendors have become cautious about which VARs they will allow to install their networks. Poor installation jobs can be interpreted as poor performance of a vendor's product," he adds.

And when companies don't have what they consider a viable alternative, they end up installing the LAN themselves.

At the U.S. Army base in Fort Stewart, Ga., Chuck McCallar, a computer specialist and programmer/analyst, says his group cut its network teeth in 1987 by installing some smaller LANs built on Intel Corp.'s Opennet network, which uses Intel's Systems 310 and 320 as network servers running Microsoft Corp.'s Xenix operating system.

"It was a learning process and difficult at times, but the hands-on approach is the best way to learn," says McCallar, who had the advantage of having worked as a computer consultant for a year before his current position. McCallar cautions, however, that there are times when it might be better to go outside for help.

"I occasionally get calls from people who are trying to expand their existing networks and have run into problems," McCallar explains. "They have installed networks and think it will be easy to reconfigure them, but they find network buses won't work together, motherboards are incompatible, the software they were told is multiuser isn't and so on. Vendors are at fault. Most users choose products available in the market that vendors say are standard. A lot of times [the components] just don't work together."

A job for Freud

To add to the difficulties, McCallar claims, there is often a psychological barrier to hurdle when installing networks.

"People have learned that PCs are stand-alone and have little idea of how difficult it is

stringing these stand-alone devices together into a network," McCallar explains. "The vendors tell you that everything is easy to install, but there is a horrific learning curve involved. With LANs, I think you only start getting your money's worth [about] six months after the installation."

John Schmidt, systems analyst at American Hardware Insurance Group in Minneapolis, installed three IBM Token-Ring LANs a year ago and says that the big surprise was how much time was consumed.

Software troubles

"The network hardware wasn't difficult, but the software gave us problems," Schmidt says. "At first we used IBM's LAN operating system but found it difficult to fine-tune to give us maximum performance. We opted for Novell, Inc.'s Netware operating system instead."

Working with a colleague and buying the necessary LAN components from a local VAR, Schmidt says that the only time they called for outside help was for the creation of some insurance-rating software for their networked IBM Personal Computers. "There's something to be gained by doing it yourself," Schmidt says. "But there is definitely a time trade-off."

The manager of the information center at a Colorado rubber products manufacturer says his firm had to rely on a local dealer to handle the conversion of an older Datapoint Corp. network to a Novell LAN.

"The dealer was responsible for the [network] specs and installation," the manager says. "We wanted the new [Novell] network because it was microcomputer based and more in line with our corporate computing philosophy. We would have tried [the network conversion] but we ran into a tangle trying to recompile existing Datapoint applications over to the Novell operating system."

Fortunately, the manager says, his company came across a small software house that offered Datapoint-to-Novell software conversion. Even so, the manager explains, the software firm had to "thread the needle" to make the software transference a success.

"It was a learning experience for us," the manager says. "We have plans for some more LANs, and I think with the proper network parts inventory in place, we can try it ourselves."

> **"There's something to be gained by doing it yourself. But there is definitely a time trade-off."**
>
> JOHN SCHMIDT
> AMERICAN HARDWARE
> INSURANCE GROUP

Some other interesting points came out of The Ledgeway Group study. For instance, while the number of corporations handling network installations in-house is on the rise, users apparently now are looking more to outside help for what the research firm calls more "intellectual networking considerations," such as network design and integration with other LANs and larger networks. In fact, many user corporations now expect such intellectual services bundled into vendor network product offerings.

The Ledgeway Group attributes a good deal of these expectations to a maturation of the networking market. In 1985, the research house says, users needed network planning, installation and support. In 1986, there was more concern with the maintenance of existing networks. In 1987, user requirements switched to improving existing networks.

As existing LANs become bigger and are plugged into larger wide-area networks, often international in scope, the design elements of these networks will become an important concern for users, The Ledgeway Group reports.

Andrea McCurdy, a research analyst at The Yankee

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Group, says she also sees more organizations seeking outside help when integrating corporatewide networks with LANs.

Dramatic change

"I agree that there are now a lot of people installing their own networks at the LAN level," McCurdy says. "But the situation changes dramatically when these smaller networks become part of larger, more sophisticated backbone networks. At this level, most firms are [giving] both installation and maintenance of LAN and wide-area space to outside sources."

Robert Guaraldi, president of Valinor, Inc., a network VAR in Westford, Mass., says his company spends a lot of time setting up network support groups within client companies.

"You can tell me that corporations are installing more networks themselves, but I can reply from experience that even the largest companies have few resources available in-house to handle networking," Guaraldi says. "A large part of our business involves setting up LAN support groups in client corporations to handle LAN installations and other network concerns. But we will still have to support these groups over the years."

Initial network installation is hard enough, Guaraldi says, but he claims that networking is now generally so complex that clients need a constant update and supply of network resources to keep them current and competitive.

"Once you emerge from an initial networking stage, you can run right into trouble," Guaraldi says. "Suddenly, you're into data center designs, structural designs, gateways and communications with remote systems — networking design elements that users rarely foresee. We can help because we have dealt with a much broader spectrum of issues than most users have. It's our job."

Synergism of elements

Many corporate users, according to Nathan Roseman, president of LAN Services, Inc. in New York, are entering the synergism stage of networking, or putting the network elements — such as PCs, servers, gateways, network backup and disaster recovery — together. At this level, networks suddenly become more strategically important and also harder to manage. It's simply too much to handle for many corporate networking groups.

"When you're transferring files among small and large systems, even an older technology like protocol conversion can be a problem," the U.S. Army's McCallar explains. "For a start, you can lose graphics characters and timing sequences for error checking. At a certain point, networking becomes a big chess game. That's why I feel service and maintenance agreements are absolutely essential with networks today. Unless you have a computer guru who can do it all, I think maintenance contracts are worth the price."

American Hardware Insurance's Schmidt claims that his Novell network is so reliable that his company doesn't need a maintenance contract. "But that's at the local-area network level," Schmidt says. "At the host communications level, we have had to bring in our MIS expert, whom we call 'the CICS man.' It becomes complex."

The manager at the Colorado rubber company says that a local VAR wanted nearly $6,000 per year for a maintenance contract to work on a 16-workstation LAN. "Instead, we hired a maintenance man, purchased some network backup components and put together a backup LAN in case of a failure," the manager says. "We just have to hope that the LAN problem won't be in the file server. As for merging with some of our larger data networks, we might have to call in help for that."

Guaraldi says that while many corporations are stabilizing around current network standards, the constant merging of voice channels with transmission media and technologies, such as twisted pair, Ethernet and token ring, is bringing more need for contact with corporate telecommunications people.

On one hand

"It's funny. On one hand, networking standards make it easier to install and maintain networks," Guaraldi explains. "On the other hand, there is now a need to coordinate more complex network technologies and design factors."

According to Richard C. Munn, president of The Ledgeway Group, customers are past the network improvements stage and are now looking for products that facilitate self-support of already-installed networks.

As a result, Munn says, there is a growing market for network diagnostic, testing and monitoring/analysis equipment that enables network users to fine-tune and manage these growing networks and reduce reliance on outside help. IBM's Netview/PC and Token-Ring Network Trace and Performance Program systems, for example, were designed to monitor IBM networks from the mainframe down to PCs, and there are other such systems coming onto the market that penetrate to the file and record levels of LAN workstations.

About to reach the market are other promising LAN transmission technologies that should help users in the installation of their own LANs. Obviating the need to install special LAN cabling, companies such as 3Com Corp., Hewlett-

Continued on page 34

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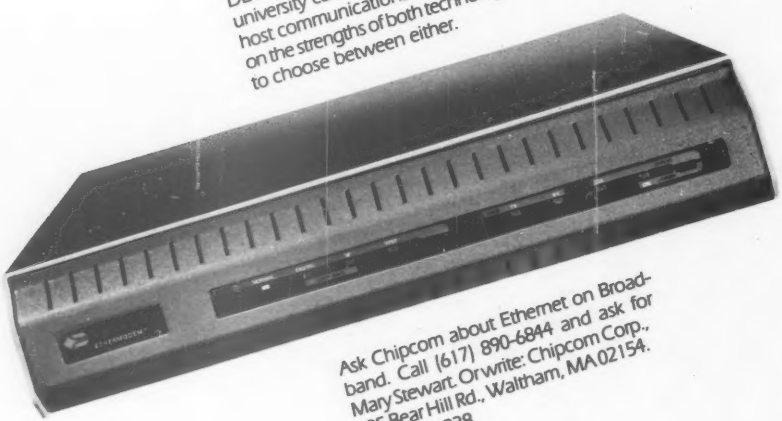

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The LAN server dilemma

BY LEE DOYLE
SPECIAL TO CW FOCUS

IBM's recent announcement of its OS/2 LAN Server has created tremendous confusion in the market for personal computer networks. Users, already knee-deep in numerous local-area network hardware and software choices, now must evaluate a new IBM network operating system.

Why should PC users and large organizations be interested in the OS/2 LAN Server? What are the advantages of the OS/2 LAN Server over existing operating systems from 3Com Corp. and Novell, Inc.? Why should we wait until November for IBM to introduce this product? This article seeks to answer these questions and dispel the fear and uncertainty surrounding PC LAN operating systems.

Despite confusion over operating systems, PC LANs continue to represent a viable option for work group communications and multiuser applications. International Data Corp. (IDC), a Framingham, Mass.-based research firm, predicts tremendous market growth and increased penetration of PC LANs in all types of organizations.

IBM's OS/2 LAN Server is targeted to large organizations that wish to tie their personal computers to IBM mainframes and minicomputers. As its name implies, the LAN Server was designed for PCs that run OS/2, not IBM PC-DOS. Users in small organizations, individuals with PCs running PC-DOS and no plan to upgrade to OS/2 and firms that do not intend to connect their PCs to larger IBM systems should not consider buying the OS/2 LAN Server. LAN operating systems designed for PC-DOS or Microsoft Corp. MS-DOS-based PCs (like 3Com's 3+ and Novell's Advanced Netware) will continue to be the best options for most users for the next few years.

IBM announced four products that impact PC LANs:

- OS/2 Extended Edition 1.0. OS/2 Extended Edition 1.0 implements Systems Applications Architecture (SAA) on the workstation through the Communications Manager and the Data Manager. Version 1.0, which does not include the Presentation Manager (Microsoft's Windows) or LAN support, is available in July. It costs $795.
- OS/2 Extended Edition Version 1.1. This version, which includes the Presentation Manager and LAN support, will be available in November. The price is $795.
- OS/2 LAN Server Program. The LAN Server Program is an extension of OS/2 Extended Edition that provides LAN service for OS/2 Extended and PC-DOS workstations. Available in November, it costs $995.
- PC LAN Program 1.3. This is an upgrade to IBM's PC LAN Program for PC-DOS PCs that offers users increased security and administrative features. PC-DOS workstations must upgrade to Version 1.3 to access the OS/2 LAN Server. Availability is July. It costs $225.

The OS/2 LAN Server extends the functions of OS/2 Extended Edition to a work group of PCs. IBM licensed part of Microsoft's LAN Manager — the Redirector and Server — for use in the LAN Server.

Much like the LAN Manager, IBM's LAN Server offers application developers the ability to design new distributed applications that can run between different PCs on the LAN. A feature called Remote Program Execution allows one PC to request another workstation to sort a data base without having physical access to the data. Other significant features include improved security and administration, windowing, multitasking and extended memory addressing.

IBM's goal for the LAN Server is to provide communications between the LAN and larger systems via SAA. At the workstation level, OS/2 Extended Edition's Communications Manager supports extensive communications, including LU6.2, between PCs and larger IBM systems. IBM's long-term emphasis is on LU6.2 for intra- and supra-LAN communications. But the announced version of OS/2 LAN Server does not support intra-LAN communications via LU6.2. The LAN Server does not provide backward compatibility with most existing PC-DOS LAN applications through support of Netbios and Microsoft's Redirector.

This comes as no surprise. IBM has a terrible track record when it comes to PC LAN operating systems.

In 1985, IBM introduced the PC LAN program, a product plagued by bugs, poor performance and a limited user interface. Almost three years later, IBM's PC LAN program is still way behind Novell in terms of features and performance. In fact, many large IBM shops in the Fortune 500 still regard Novell as the leader in PC LANs.

The question now is, Will the OS/2 LAN Server be any better? Even before its introduction, the OS/2 LAN Server will have the following limitations:

- **Cost.** To achieve the benefits of the $995 OS/2 LAN Server, workstations must run the $795 OS/2 Extended Edition, which requires an Intel Corp. 80286 or 80386 processor with 3M bytes or more of random-access memory. It will cost a typical IBM Personal Computer AT user more than $2,000 just to be able to run OS/2.
- **Delays.** The OS/2 LAN Server offers many features, such as improved security and administration, that Novell's Advanced Netware already offers today. Why should users wait?
- **Lack of software.** OS/2 applications that take advantage of the features of Extended Edition and the LAN Server are anywhere from one to three years away.
- **SAA support.** OS/2 LAN Server does not offer full SAA support for LANs. The LAN Server is based on Netbios, which SAA does not support, and will not support LU6.2 and, thus, SAA, until at least 1989.

Migration to OS/2 requires a tremendous commitment by an organization in terms of cost, support, development of new applications and belief in IBM's announced but undelivered products. Besides, most OS/2 applications, which will enhance the productivity of end users, are 18 months to two years away.

Doyle is manager of strategies for microcomputers and office systems at International Data Corp., a market research firm in Framingham, Mass.

IDC's research indicates that only a small percentage, perhaps as little as 5%, of all corporate users will migrate to OS/2 before 1989.

The IBM announcements create considerable confusion for PC LAN software developers. Developers can continue to write PC-DOS applications to the existing de facto standards — Microsoft's MS-Net, Redirector and Netbios. IDC figures indicate that more than 250,000 PC-DOS-compatible LANs were installed by year-end 1987. Given this installed base, the slow rate of OS/2 sales and the ability to run Netbios applications under the LAN Server, this option represents a safe bet for many developers.

Developers can also write to OS/2 Extended Edition and LAN Server. Many large software vendors (certainly Lotus Development Corp.) are predicted to start development for IBM's SAA environment. However, IDC does not expect Extended Edition applications for workstations until 1989 at the earliest. LAN applications for the Extended Edition will probably await implementation of LU6.2 support in the LAN Server.

Don't forget Microsoft, 3Com

Software developers may also want to write to Microsoft's and 3Com's LAN manager products. While similar to IBM's LAN Server, these products will not be completely compatible.

They can also write to Novell's Advanced Netware. Novell products are not currently compatible with OS/2 or the LAN Server.

This multiplicity of standards is likely to delay development of new OS/2-based LAN applications until the confusion surrounding LAN application standards and third-party support is resolved.

3Com was certainly hoping that IBM would implement Microsoft's LAN Manager (specifically, "named pipes," which is Microsoft's protocol for PC-to-PC communications over a LAN) in the LAN Server. Because IBM did not take this course of action, 3Com, in partnership with Microsoft, says it will develop an OS/2-based operating system that is compatible and competitive with IBM's LAN Server.

3Com has announced 3+Open, its OS/2 LAN product, which will implement LU6.2, named pipes, Netbios and Redirector, for delivery in June 1988. 3+Open will support MS-DOS, OS/2 and Apple Computer, Inc. Macintosh workstations.

Novell is said to be the leader in PC LAN operating systems in terms of functionality and market share. Many of the features that IBM is promising for late 1988, Novell already delivers, including logon security. Despite this competitive advantage, Novell must implement OS/2 and OS/2 Extended Edition support in Advanced Netware this year if it wants to compete with IBM in large accounts. IDC reports that Novell most likely will implement OS/2 support via a coprocessor running within an IBM Micro Channel-based Personal System/2 during 1988.

Despite considerable confusion about LAN operating systems, users need not be paralyzed. Organizations that have installed non-IBM LAN operating systems can continue to make valuable use of these products while waiting to evaluate IBM products.

Organizations currently looking to install PC LANs have a more difficult choice. If the firm is committed to IBM, if it plans to implement OS/2 and SAA within the next two to three years and if it requires communications between the LAN and large IBM systems for its LAN application, then it should wait and implement OS/2 Extended Edition and the LAN Server. However, if PC-DOS workstations will continue to be dominant, if the organization is skeptical of SAA or if its LAN was designed for primarily intra-LAN applications, then it should evaluate and implement current LAN operating systems products, including those from Novell and 3Com.

Most non-IBM LAN vendors are committed to support of OS/2, OS/2 Extended Edition and the LAN Server. IDC expects Novell, 3Com and Microsoft to deliver products, compatible with IBM's offerings, during 1988 and 1989. Thus, current Novell and 3Com customers will get a migration path to OS/2 and SAA. ❖

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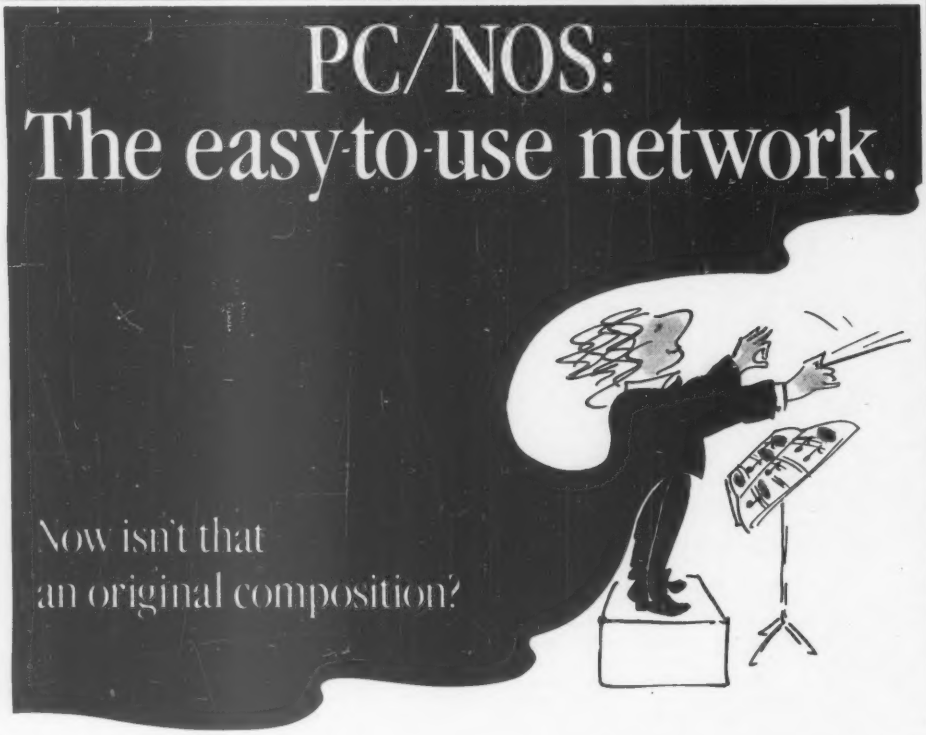

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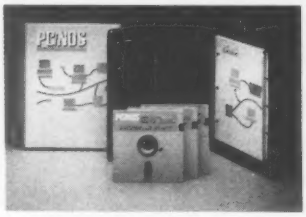

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LAN man

Continued from page 32

Packard Co. and Digital Equipment Corp. are developing LANs using same-premise unshielded twisted-pair wiring with data transmissions to 10M bit/sec.

Other possibilities include wireless LANs using radio frequency to transmit data from workstation to workstation, LANs based on infrared transmission and LANs carrying data over voice networks. Though such alternate technologies promise benefits such as ease of LAN installation and reconfiguration as well as lower costs per node, each will also be burdened with such trade-offs as slow transmission speeds and limited operating distances.

According to some, there will always be LAN service vendors.

"We've been in this business five years," Guaraldi says. "What's interesting is that there is still a great deal of reliance, even among the biggest corporations, on outside firms for the installation and maintenance of networks — even LANs. I don't see that situation changing for quite some time." ❖

Pulling for distributed data bases

What's holding things up?

BY STAN KOLODZIEJ

From the beginning, distributed data base management systems have been on the defensive. Called on the carpet about problems with file and record locking, data integrity and security, vendors of distributed DBMSs have usually been short on answers in the past. But now vendors are coming up with better answers. Advances in data base technology are making many MIS managers take a second look at distributed DBMSs.

Benefits are spilling over from the success of the relational systems market, which is being stimulated by the movement to settle on the dual standards of IBM's SQL and DB2, its relational DBMS. Because most distributed DBMSs are relational in nature, the success of relational data bases will have a direct effect on the sales of distributed DBMSs.

And also because of the success of relational DBMSs, MIS is focusing more attention on the benefits of distributing these data bases within their companies.

Stephen Gerrard, vice-president of marketing at Applied Data Research, Inc. (ADR), a software development firm located in Princeton, N.J., points to the continual downsizing of mainframes and systems development as helping to lay the groundwork for distributing data bases.

"The hardware and operating system infrastructure will proliferate on IBM 9370s and other departmental machines, [a situation that will help] make the distributed data base concept work," Gerrard explains. "Before the 9370s came along, the distributed part of the data base equation was confined to simply uploading and downloading data."

But Gerrard is quick to add that distributed DBMSs will not be right for every corporation.

"It's typically the larger companies, those that have multiple computers and that are geographically spread out, that really need distributed data bases," he says. "These corporations will be pioneering distributed data base technology."

Rich Scheffer, director of marketing communications at Sybase, Inc., a Berkeley, Calif., vendor of relational DBMSs, says there is still work to be done at the management end of distributed data bases before they can attract more customers.

"It gets complicated when you have to store some of your data in one file server and some data in another, remote server," Scheffer says.

"When you update a transaction, for example, you have to make sure that the data bases in both servers are affected simultaneously. That is the kind of simple but critical requirement in distributing data bases that is difficult to carry out," he explains.

Kolodziej is *Computerworld Focus*'s senior editor.

To accomplish this goal requires a data base facility called a Two-Phase Commit, which enables a user to update multiple data base transactions over a network, Scheffer explains.

"However, most distributed DBMSs handle such update integrity at the local-applications level only, not at the network server level," Scheffer says. "I don't think you can handle true distributed data base management from the application level. Until most distributed data base vendors bring in more of such centralized network control, I don't think distributed data bases are going to become a big-ticket item with companies."

Others, however, suggest that distributed DBMS vendors still have some larger wrinkles to iron out.

Ron Ross, a Houston-based lecturer on software and editor of the "Data Base Newsletter," is skeptical that distributed DBMSs can succeed in their current state.

Cosmetic changes

"Maybe I'm a cynic, but I think that most distributed data base management systems have superficial capabilities," Ross explains. "There's still a lot of work to be done with things like transaction updating, data replication and referential integrity," he says. "Vendors claim they have taken care of these problems, but I think a lot of it is cosmetic.

"There are some, like myself, who maintain that data integrity, the ability of allowing multiple users to handle data bases at the same time, is just not there," Ross continues.

"DB2 and many other relational data bases don't even support referential integrity. The future of distributed data bases does not lie in the languages they are written in, it lies in the rules governing the integrity of the data they contain," he says.

Fair enough, but the trade-off, Ross explains, is that the greater the number of data integrity rules embedded within a distributed data base system, the more processing and transmission baggage created.

"What you basically have, then, is a situation in which the more data integrity built into your product, the more complicated it is to handle and run over a network," Ross says.

Even at a low-end level, melding data integrity with networks can be tough.

Ashton-Tate Corp.'s Dbase III Plus data base product, for example, contains networking features that the vendor is aiming at programmers who work in a local-area network environment. There are some problems, however, with file and record locking, but Ashton-Tate is not alone in that regard.

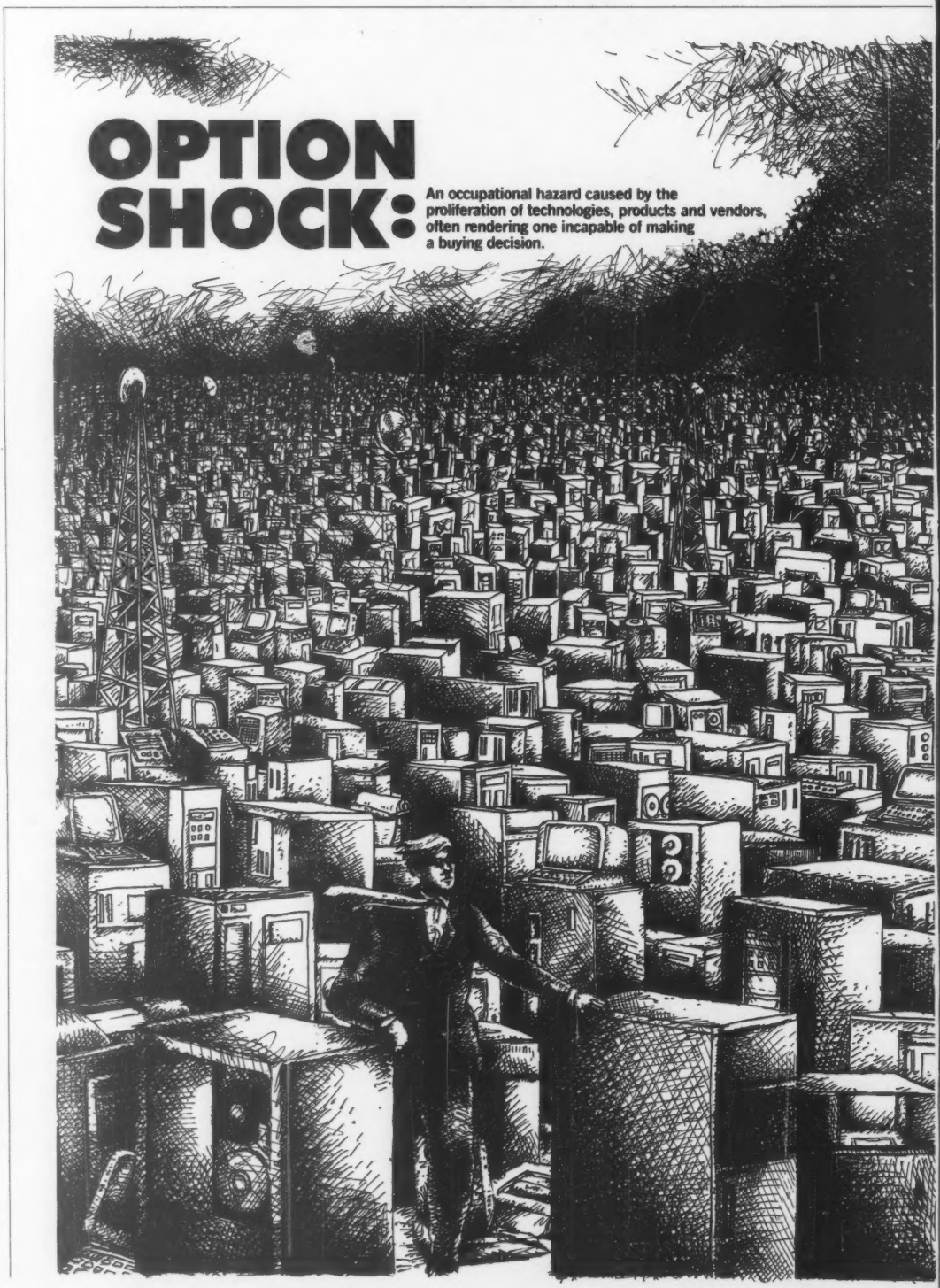
In itself, the concept of file and record locking is simple. When two users on a network wish to look into the same data base at the same time, there is no problem as long as all they want to do is look. However, headaches can occur if the users want to edit the data in the data base at the same time. The trick with file and record locking is in preventing one user from changing a record while the other user is working on it. Adequate file and record locking will enable a second user to access the record only after changes have been made and the record is saved.

The problem with the Dbase networking version stems from the limitations of the record lock function of Microsoft Corp.'s MS-DOS, under which Dbase is written. The MS-DOS function not only locks a record in use from being used by others but also erects a barrier so users cannot get at any data that pertains to that locked record. These steps make it difficult for users who have opened a data base with a locked record to move past it. In essence, what this does is block the part of the logical data base below that record from other users.

IBM has promised that its scheduled 1988 OS/2 networking extensions will resolve MS-DOS's record locking problems.

LAN vendors help out

Ashton-Tate's situation, however, points to the growing presence of networking companies,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An occupational hazard caused by the proliferation of technologies, products and vendors, often rendering one incapable of making a buying decision.

especially LAN vendors, in the role of bringing distributed data bases to market.

Novell, Inc., the Provo, Utah, developer of the Netware LAN operating system, for example, has announced marketing alliances with both Oracle Corp. and Ashton-Tate.

Commenting on the Novell alliance, Lawrence J. Ellison, Oracle president and chief executive officer, says, "It will allow many applications that have been handled by minicomputers or even mainframes to be run on networked personal computers."

Ellison categorizes the Novell agreement as a key in completing Oracle's SQL Star distributed data base marketing strategy.

Howard S. Charney, a senior vice-president at Santa Clara, Calif., LAN vendor 3Com Corp., says the company is planning on migrating IBM's OS/2 operating system to 3Com's file servers to enable the development of distributed multitasking applications and data bases over 3Com's LAN.

Novell has even more ambitious plans for the future of distributed data bases. The company has recently begun marketing The Coordinator, a relational data base networking product that breaks down and collates patterns of communication following the theories of visionaries Fernando Flores and Terry Winograd, co-founders of Action Technologies, Inc., the San Francisco company that produces The Coordinator.

Rick Mellinger, Action Technologies' president, says that although at first blush The Coordinator seems like any other electronic mail system, on deeper analysis clients find it to be a software system that can search data bases and bring together disparate trails of communications following the parameters given by individual users.

"You can relate these items by any category you wish," Mellinger says, claiming that The Coordinator is the first of a new class of software tools that will support the integrated and coordinated work of a group of people.

This ability contrasts with what he says are the usual set of software tools that support individuals who happen to work with each other.

"MIS managers can no longer raise the drawbridge and keep users out."

STEPHEN GERRARD
APPLIED DATA RESEARCH, INC.

According to Mellinger, one component of The Coordinator, the Conversation Manager, has been expanded into the Message Handling Service (MHS), which is basically an operating system. Using MHS, Mellinger says, programmers and software developers will be able to build distributed computer data bases using the same "interpreting" principles The Coordinator employs.

The importance of networking companies in the future of distributed DBMSs is also bound to change the concept of corporate computing.

3Com's Charney, for example, sees distributed data bases and networking "leading to the distributed power of the [corporate] work group."

Michael Radice, group vice-president of Electronic Form Systems, a software developer based in Carrollton, Texas, thinks the availability of distributed data bases will lead to significant savings in corporate software development costs and enable more PC integration with systems development.

Distributed data bases will help create more advanced user interfaces, enabling users to access data in ways that more closely reflect how people think, according to David Liddle, chairman of Metaphor Computer Systems, Inc., a Mountain View, Calif., producer of front-end software for relational data bases.

Perhaps MIS attitudes toward micros will evolve as PCs are incorporated into the infrastructure of distributed data bases and not just used in more

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passive data upload/download roles.

"MIS has learned how to manage a centralized data operation during the past 20 years," Gerrard says. "When you come at them with distributed data bases, and they see the problems with data recovery with breakdowns in recovery restarts across network data base nodes, their immediate reaction is to pull back into a safer centralized approach.

"Yet I think MIS also knows it has to work with end users to wrestle with these issues now and resolve them," Gerrard says. "MIS managers can no longer raise the drawbridge and keep users out. I think that now they realize distributed data bases are going to be the way of the future, and they're more open-minded. But we still have to do some hard selling."

Probably. With MIS retaining a good measure of control over corporate micros, it will also, theoretically, be in the driver's seat when it comes to buying and installing the powerful micros/file servers required to drive networks carrying distributed DBMSs. In fact, MIS no doubt will be scrutinizing distributed DBMSs' benefits and drawbacks at all levels.

Not now, maybe later

"We don't have any real hard need for distributed data bases now, but in the future we might use them to off-load certain information from mainframes," explains Ben Coonfield, senior data base software analyst at Browning-Ferris Industries, Inc., a Houston-based waste management company. "We have remote users, and distributed data bases could lessen their dependence on centralized data bases, which can be slow.

"But at this stage," Coonfield adds, "distributed data bases are pure speculation for us. From what I can see, there are still a lot of software bugs to iron out."

According to Delanie Patrick, vice-president of operations in the Management Services division at McCormick & Co., distributed data bases are somewhat down the line for his firm. An IBM DB2 shop, the Baltimore-based spice manufacturer is at present limited by hardware in what it can accomplish through distributed data bases, Patrick says.

"The other operating units that share our IBM mainframe have IBM System/36s and 38s, not IBM 370s," he explains. "They'll be limited in what they can do in distributing data bases. We're only now slowly migrating to DB2 application development from IBM IMS, and that's going to take some programmer retraining in itself. It's a slow process."

Newsletter editor Ross says MIS is roughly split into two camps, one that wants to move toward distributed data bases and another that is drifting away from the distributed philosophy.

It's not that there isn't a market for distributed DBMSs. Ross agrees that there is indeed a big potential market in those larger firms that become geographically or operationally dispersed "by accident," that is, through a flood of incoming PCs, mergers, the creation of divisions and so on. But Ross thinks most of the distributed DBMSs are not yet ready for market and the potential negative reaction could hurt the field even more.

Short-term solutions

"Relational data bases first came into being as theories and were delivered in reality as long-term projects," Ross explains. "Distributed data bases are another set of theories that are going to take a long time to work out. Anything coming out now will only be a short-term solution."

Don Watford, product marketing support representative at Teradata Corp., a Los Angeles data base machines developer, advises that it will be essential for distributed data bases to meet end-user needs first without disrupting the existing corporate system development structure.

"It's clear that in the future more data will be leaving the corporate mainframe to become the pivotal part of corporate processing," Watford says. "Customers will want to support different hardware systems or platforms against a single data base. And the patchwork of file transfer packages and communications protocols now used are too complex for many users. Common user interfaces are going to be a big step in distributing data bases and making networks transparent."

Because most of the data bases that will be distributed will use relational DBMSs, it reasons that IBM's SQL will probably provide the base upon which many of these common user interfaces will be forged.

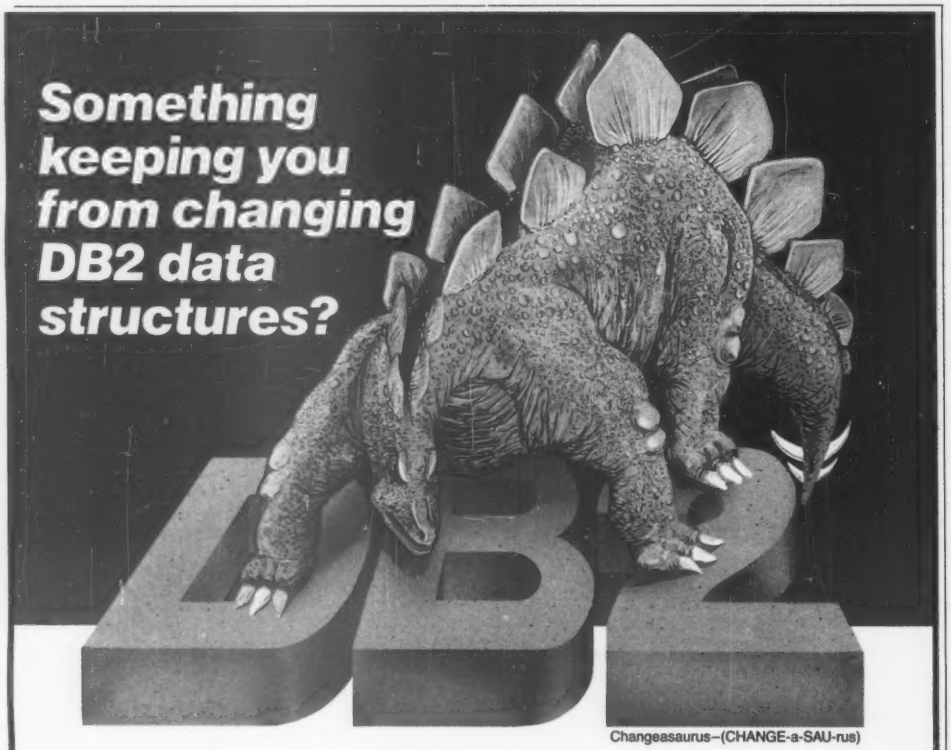
"SQL will be an important factor in making data communications transparent to users," Metaphor's Liddle says. "Users should not have to be aware of the hardware and software relationships that exist in separate data bases."

Toe the line

In this industry, it's easy to get involved in technical and marketing details and lose sight of the bottom line. In the case of a distributed DBMS, the bottom line is to make users more productive. But that could take time.

Gerrard, who says that ADR will be coming out in the first quarter of this year with Inforeach, a distributed DBMS, admits that the computer industry in general can only implement the first stages of distributed data bases.

"Whenever a new technology becomes technically feasible, there is a lag," Gerrard explains. "Organizations have to figure out how they are going to use the new technology. That's where we are now with distributed data bases." ✧



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BART GOLDMAN

Can you afford to ignore EDI?

BY PATRICIA KEEFE

It has been suggested that the effect of electronic data interchange (EDI) is much like cocaine. Once users adopt this method for conveying business transactions, it is hard to stop.

While an exaggeration, it is only a slight one. The purveyors of office automation have long since laid to rest the axiom of a paperless office, but corporate America, in its haste to say no to mountainous paperwork and its associated costs, is fast embracing EDI.

EDI facilitates direct computer-to-computer transmission and translation of formatted business information, such as orders, invoices and payments, over intraindustry networks, proprietary systems or public data networks, such as third-party mail services or clearinghouses.

Primary benefits include the elimination of geographic barriers, fewer processing errors, tighter inventory control, personnel reductions and time savings realized from electronic transmission of data between computers. If desired, users can virtually do away with hard copy, enthusiasts claim.

To get some idea of personnel savings, users can take an oft-quoted estimate of $35 to $50 per document, based on 1974 American Association of Purchasing Agents figures, and adjust for inflation.

More recent figures on potential savings can be obtained from such success stories as Chicago-based Navistar International Corp., a truck manufacturer that claims to have cut its truck inventories by a third, or $167 million, in the first 18 months of EDI use. And then there is The First National Bank of Chicago, which reportedly saved about $2.5 million per year in staff attrition.

A less obvious benefit, perhaps, is the likelihood that "implementation of EDI will force MIS to forge closer relationships between departments that need purchasing and invoice information," observes a bulletin from International Data Corp. (IDC), a Framingham, Mass.-based market research firm.

According to analysts, the top four providers of EDI services (based on number of subscribers) are GE Information Services, a unit of General Electric Co.; Sterling Software, Inc.'s Ordernet Division; McDonnell Douglas Corp.; and Kleinschmidt Computers, a division of SCM Corp. Other prominent EDI suppliers include IBM and Control Data Corp., says consultant Victor Wheatman, editor of the "EDI Reporter," published by Input, a market research firm headquartered in Mountain View, Calif.

Fast jumping into the market are communications services providers, such as Western

Keefe is a senior editor of networking at *Computerworld* newspaper, published in Framingham, Mass.

Union Corp., Compuserve, Inc. and Telenet Communications Corp., and computer vendors, including a low-key entrance by Digital Equipment Corp. Late entrants to the EDI market are expected mostly to resell existing services.

Farsighted managers who have already taken steps to implement variations of EDI will reap improved operations and strengthened trading relationships, proponents claim.

And within a few years, businesses that have delayed conversion to EDI will quickly find electronic billing, shipping and ordering a competitive necessity, The First National Bank of Chicago predicted in a white paper presented in 1986.

The bank confidently estimates that during the next decade, approximately 50% of all business transactions will be converted from paper to electronic documents.

First National's figures may not be too far off. Wheatman expects the market to swell during a five-year period as follows: $86 million to $87 million in 1987; $191 million in 1988; $428 million in 1989; $793 million in 1990; and $1.31 billion by 1991. "We expect an 88% average growth rate, mostly in processing and communications," he says.

Jack Shaw, president of EDI Strategies, Inc., a Marietta, Ga.-based consulting firm, adds that the EDI market will double or triple in annual growth rate during the next five years.

Some of the U.S.'s largest and most influential manufacturers and financial institutions are leading the way to EDI acceptance in corporate America.

The list of EDI users is a veritable who's who of the Fortune 1,000: GE Information Services, Ford Motor Co., General Motors Corp., General Mills, Inc., General Foods Corp., 3M Co., K Mart Corp., Procter & Gamble Co., J. C. Penney Co., Sears Roebuck and Co., Consolidated Rail Corp. (Conrail) and Bethlehem Steel Corp. Key banks include Chase Manhattan Bank, Citicorp and Security Pacific Corp.

> **"Doing business without electronic data interchange will soon be like doing business without a telephone."**
>
> EDWARD E. LUCENTE
> IBM'S INFORMATION SYSTEMS GROUP

What these organizations have in common is the financial clout to pull any customer, supplier or buyer into an EDI network.

"A lot of users are getting in on a reactive mode," Shaw explains. "A big customer says, 'Take our orders electronically,' or a major supplier offers more advantageous terms and pricing, so the users decide, 'Gosh, I guess I should do this.' "

IDC claims that this user interest in EDI will increase during the next five years as industry trendsetters shift from EDI pilot projects to full-scale implementations. In some cases, these leadership companies will be abetted by their EDI service providers.

GE Information Services, for example, is considered the largest EDI service provider. And no one markets its services better, according to Sherry Geddes, managing partner of CTPS, Inc., computer and telecom consultants based in Mountain View.

Covering all the bases

"When GE signs up a client for any service, they hold a conference with all the client's suppliers and explain that company ABC has decided to go the EDI route, and this is what they will have to do to continue to be a supplier for this company," Geddes explains. In this manner, signing one client often produces other clients from a handful of smaller, related companies, she adds.

Conrail, another innovator, entices customers who use EDI with a 10% discount, Input's Wheatman states.

EDI picked up some weighty support from IBM at November 1987's 19th National EDI Systems Forum and Exhibit in Washington, D.C. The forum was sponsored by the Transportation Data Coordinating Committee (TDCC) and the Electronic Data Interchange Association.

"Doing business without EDI will soon be like doing business without a telephone," said show keynote speaker Edward E. Lucente, an IBM vice-president and head of IBM's Information Systems Group.

Noting that IBM has already committed to EDI internally, Lucente said the vendor plans to play a stronger role in the EDI market through commercial sales of its 5-year-old Information Network, a time-sharing service based on the company's Systems Network Architecture (SNA). IBM is targeting links to 12,000 of its largest suppliers by 1991, he added.

With that objective in mind, IBM met with actual and prospective EDI users last August in an attempt to boost subscriptions to Information Network.

IBM's viewpoint

How serious is IBM about EDI? "IBM regularly thinks of markets in terms of how big [they are] in relation to mainframes," explains Thomas White, president of Infonetics, Inc., a communications consulting firm in Santa Clara, Calif. The primary source of most EDI documents

How Customer Support Will Keep Pace with Tomorrow's Modem Technology

Created by Dayner/Hall, Inc., Winter Park, Florida

being transmitted today, he adds, is an IBM mainframe, and mainframes are still the major focus of IBM's sales efforts.

While an IBM service may prove attractive to Big Blue shops, analysts note that many such shops already either subscribe to value-added network-based systems or have sunk substantial investments into private networks and may be reluctant to switch.

Additionally, efforts to attract smaller IBM shops could be derailed if those users are forced to conform to EDI network standards mandated by larger business partners.

It is precisely this sort of domino effect that was revealed in a recent survey conducted by Coopers & Lybrand, the Bank Administration Institute and EDI Strategies. The study was underwritten by 12 banks, including Chemical Bank, Bank of Boston and Manufacturers Hanover Trust Co.

The full implementation of EDI is neither for the faint of heart nor slim of wallet. International Data Corp. estimates it will take six to nine months to bring up a major EDI hub within an organization.

Results were compiled from the responses of 600 DP managers, financial managers and EDI coordinators at more than 400 U.S. corporations and included a telephone survey of 125 EDI users and interviews with another 25 EDI innovators.

According to the report, EDI users said they are expanding their EDI activities from purchase order and invoice transactions to include electronic payments.

As such, these users expect their commercial banks to handle EDI-related financial transactions.

"EDI for banks is going to come on strong as EDI becomes more entrenched among users," says Donald Monks, an executive vice-president of product development at New York-based Irving Trust Co., one of the study's co-sponsors.

"Banks are the missing piece," Input's Wheatman agrees. However, before banks and other users can wholeheartedly endorse EDI, there are some nagging technical issues that must be resolved.

Utilizing an umbrella family of standards as a common base, such as the ANSI X.12 data interchange protocols or those sponsored by TDCC, a host of EDI substandards have sprung up, customized to and supported by as many as 30 different industries.

Herein lies the rub. For example, tailoring EDI systems to specific industries shapes up into a poor fit for internetworking in which manufacturing, retail and banking standards collide. But supporting incompatible, parallel EDI networks is expensive and can dredge up numerous management issues.

Also, users could lose some ability to design their own business forms when transaction sets, or electronic forms, are standardized.

Not only must the forms be adapted, but EDI communications, such as the transmission method, the rate at which the transmission is sent and the kind of equipment involved in the transaction, are still evolving.

Different industries have tended to settle on particular third-party networks — the insurance field generally uses Information Network, office systems tend to rely on GE Information Services and so on — which is fine, unless you want to talk to a company outside your industry.

A solution may be in sight, however. "One trend I see in 1988 is private suppliers building gateways to public networks," Wheatman says.

Another cause for concern is whether EDI will add to a growing morass of incompatible message delivery systems instead of combining with existing and emerging communications environments, such as IBM's SNA, electronic funds transfer (EFT) and CCITT's X.400 electronic mail standard.

Reluctant to merge

Right now, many EFT users are reluctant to merge those networks with EDI. Users say they don't want to bog down their EDI transactions, assuming their electronic forms provide for the addition of supplemental information, Infonetic's White says.

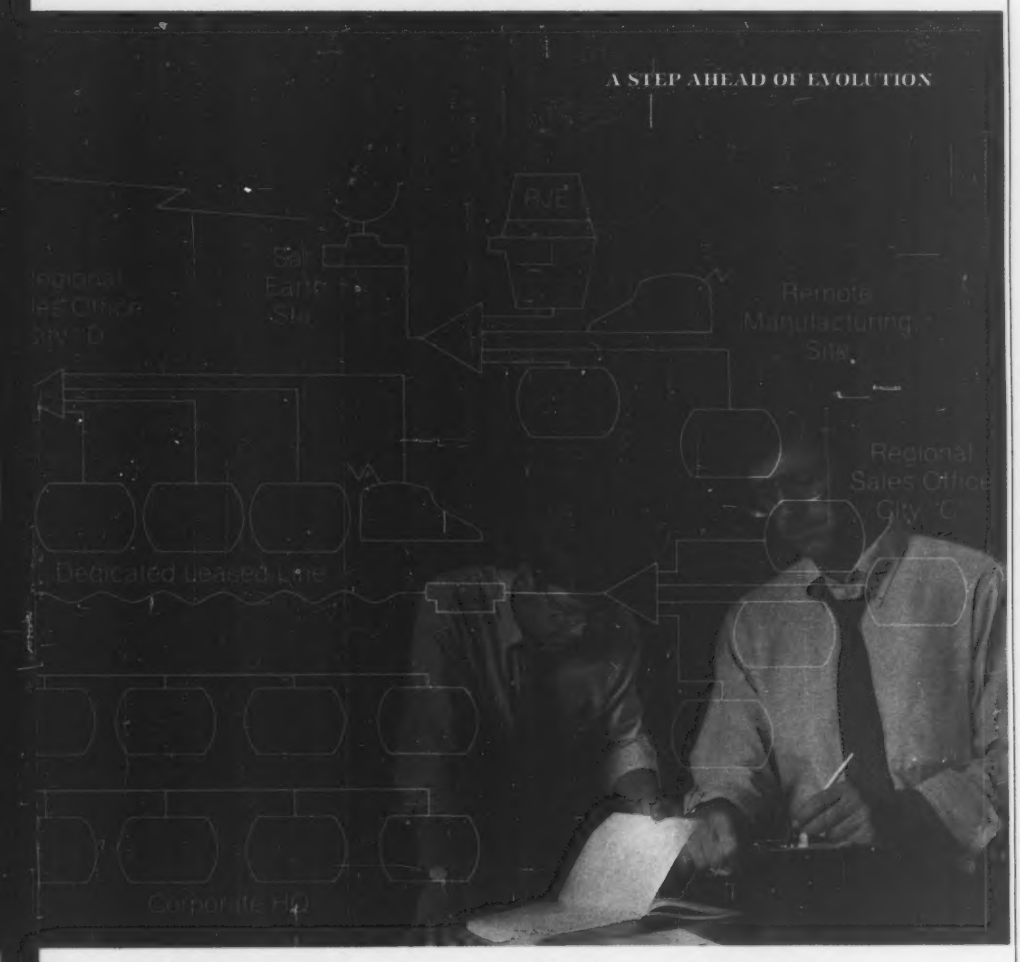
He also suggests that combining EFT with EDI will require wider bandwidth, which in turn will necessitate new protocols, all of which White estimates are about five years off.

Information security is also a factor, particularly in the banking community, which is loathe to transmit unprotected financial data. According to users interviewed by Input, the No. 1 EDI-related concern is security.

Given that many users today are still grappling with the integration of departmental and backbone networks, it is doubtful that most would be ready to attempt a merger of parallel intercompany messaging systems.

Moreover, the full implementation of EDI is neither for the faint of heart nor slim of wallet. IDC estimates it will take six to nine months to bring up a major EDI hub within an organization.

This process absolutely cannot be done without the commitment and full support of top management, asserts Irving Trust's Monks — especially, when



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Analysts still optimistic

Despite EDI's apparent drawbacks and limitations, none of the problems has managed to dampen analysts' optimistic market growth projections.

Industry observers' confidence is undoubtedly due in large part to the relief the ANSI X.12 standard offers from the horrors of EDI systems incompatibility. Seen as a flexible, generic business data interchange standard, X.12 is said to be a lightning rod for EDI and has picked up considerable support during the last quarter of 1987.

One example of this support is the Department of Defense's official endorsement of the standard at the National EDI Systems Forum. In addition, various European standards-making bodies have indicated they will move toward X.12.

Industry groups are expected to adapt the basics of X.12 to their specific requirements. According to IDC, Fortune 1,000 companies will use X.12 to automate their purchasing processes but will continue to use private or company-sponsored networks.

Relief related to efforts to rally around X.12 will come in stages. IDC claims that while X.12 will allow for extensive intraindustry document exchange by 1990, it is too broad to facilitate extensive cross-industry traffic until well into the next decade.

For example, although some EDI systems face a relatively painless migration to the ANSI standard, EFT and several developing international standards are incompatible.

Ironing out the wrinkles

Any remaining differences can probably be ironed out with a little effort, Monks says. "The fact that ANSI X.12 won't require any major rewrite jobs is pure and simply why it will succeed," White agrees.

EDI Strategies' Shaw predicts that as standards begin to solidify, the number of EDI service suppliers is expected to jump, expanding the market by as much as 15 to 20 vendors in the next few years. This increasing competition, spurred in part by the Federal Communications Commission's anticipated rejection of a proposed tariff increase, will likely result in lower transmission rates, according to many analysts.

Initially, the FCC proposed imposing access charges on enhanced service providers and information services companies, such as Tymnet from Tymnet/McDonnell Douglas Network Systems Co. and Telenet from Telenet Communications, on the grounds that they should pay their fair share of the cost of connecting to local exchanges. In turn, the additional cost to users of the information services has been estimated at $4 to $5 for dial-up access, essentially doubling the price of a typical transaction. The FCC also reportedly wants to impose the same access charge on private networks.

> **"The fact that ANSI X.12 won't require any major rewrite jobs is pure and simply why it will succeed."**
>
> THOMAS WHITE
> INFONETICS, INC.

"The tariffs issue generated the second greatest amount of negative mail the FCC has ever received, after Christian broadcasting," claims a source who asked not to be identified. "The word around Washington is that the tariffs increase is dead."

As rates drop and competition increases, EDI providers will begin to look for alternative value-added services, Wheatman says.

This means suppliers will likely start to charge for installation and training, while stepping up public awareness programs, Shaw notes.

In particular, Input is expecting the integration of data base and graphics into EDI networks. Integrated graphics would enable users to send specs within a form or even a blueprint via EDI.

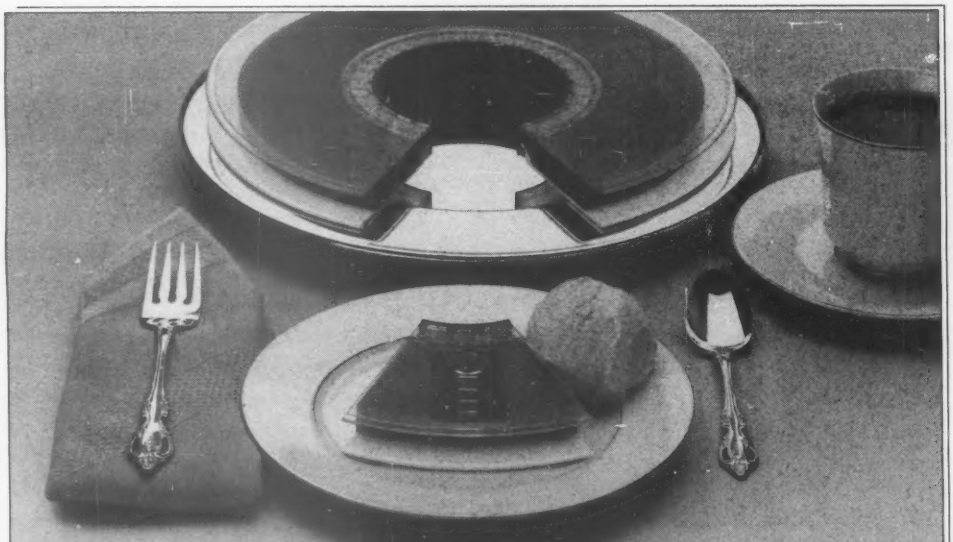
EDI-based data bases are already available on some industry-specific networks, such as those found in the pharmaceutical industry and grocery stores. They provide subscribers with sales, market share and demographics information — invaluable competitive tools, Geddes says.

EDI's potential capabilities and industry trends aside, the technology doesn't mean a thing if it is not a means to an end. Take, for example, the the auto industry, a leading proponent of EDI. Faced with increasing foreign competition, the industry set out to cut $1,500 off the cost of each auto.

It decided it could save at least $500 of that figure in paperwork and determined that EDI could provide the solution. In fact, General Motors and Ford, despite their competitive differences, worked jointly to implement an acceptable, evolving EDI system.

More and more, corporate America is turning to EDI to meet specific goals.

"If you have an objective, then all barriers to EDI begin to be identified as a problem to be resolved, rather than an obstacle to overcome," Irving Trust's Monks says. "Once users catch the fever, it will increase the appetite for EDI." ❖



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TECH TALK

Intel, Motorola walk softly, carry a big market niche

By Michael Tucker

Communications, or more precisely, connectivity, has become the hottest issue in the business these days. It's the loudest demand from users, the newest requirement for vendors and the latest opportunity for entrepreneurs and the would-be entrepreneurial enterprise.

But in the process, connectivity is producing some unusual situations. Take Motorola Corp. and its division, Motorola Computer Systems, Inc. (MCS), for instance.

Sometimes it is difficult to remember that Motorola is even in the systems business. You can't forget the company's chips — they have a certain place in history — but complete boxes just don't leap to mind when you think of Motorola.

This lapse of memory attaches itself to all the microprocessor people. You don't think of Intel Corp. as being in the systems business, either. But Intel has a whole line of products that are nothing less than full-fledged computers. These machines range from personal computer motherboards to some really radical boxes like the multiprocessor devices put out by Intel's scientific computing division.

Chip makers play an awkward but enviable role in the systems business

Yet you just don't think of Motorola or Intel in this light. And given these firms' substantial marketing muscle, it's hard to believe the downplaying of their systems role is accidental. That these two are not known as systems vendors, despite the potential for brisk sales of systems, must be because that's the way they like it.

Why is no mystery. To be companies that produce the chips that go into the vast bulk of the world's micros and, at the same time, that compete with micro vendors is, shall we say, awkward.

Intel's position may be the worst in that its reseller list includes the biggest micro vendor of all — IBM. Or more specifically, its resellers include the makers of personal computers running Microsoft's MS-DOS, the standard for business desktop computing. Intel's staff sells a lot of systems into the scientific and engineering markets (in which, in a neat turnabout, they compete directly with Motorola's customers, the workstation vendors), but they can't sell too many commercial systems without ruffling a lot of feathers on a lot of birds.

Mum on motherboards

For Intel, this setup has made for some surreal situations. For instance, in 1987, Intel spokesmen resolutely refused to comment on reports that Intel was selling 80386 motherboards to developers in direct competition with its own board-level customers. As far as you could learn from the firm, Intel was not selling, never sold and never would sell motherboards. Yet at the same time, you could pick up any computer publication and find ads from distributors for Intel 80386 motherboards. These ads even gave the Intel catalog number for the boards.

Motorola's position may be a little better than Intel's in that Motorola has only one customer aiming for the executive's desktop — Apple. But still, it might not do to offend that one customer, because Apple is the only honest-to-goodness major-league player Motorola has.

So, if you are Intel or Motorola, how do you sell your systems to MIS corporate buyers?

Well, Intel has hinted at how. In the summer of 1987, it introduced the 320 Multiserver. This offering is a combined local-area network, compute server and file server based on the 80386. It is meant, quite simply, to link PCs to each other and upwards to corporate mainframes. It will be interesting to see how well the Multiserver does, because it is, in effect, going for the position once promoted for minicomputers.

Now for Intel and others designing 386-based multiuser or server systems, the question will be in the software. These vendors have worked on single-user systems for their entire existence; Will they be able to convert to multiuser systems?

Continued on page 45

Tucker is *Computerworld Focus*'s features editor.

PRODUCT CLOSE-UP

Jnet to link VAX, SNA

Joiner Associates, Inc. has announced that the company's Jnet networking software is scheduled to support an IBM Systems Network Architecture (SNA) option by the beginning of 1988. The announcement is significant not only because it shows the continuing growth of the SNA standard but also because of the Madison, Wis., company's background.

Jnet's function has always been to link Digital Equipment Corp. VAX machines to IBM mainframes. Jnet runs on the VAX and allows the DEC machine to look and act as if it were just another peer node in an IBM store-and-forward network. It is relatively low priced — $8,500 to $25,000, depending on the installation — and easy to use and maintain, the company said.

The SNA option will make the Jnet-equipped VAX look more like a full citizen of the IBM world. It will operate in SNA networks, particularly for batch processing applications, almost as if it were an IBM machine, Joiner officials claimed.

Atari banks on Transputer in its personal workstation rollout. Page 44.

The new characteristic will be useful for Jnet customers. But Jnet's real significance is in its ancestry and close association with Bitnet, an international academic computer network that has successfully joined all manner of machines for years.

The whimsically named Bitnet — the name stands for "Because It's There Net — was originally a few data lines between some cooperating university computer centers. It recently celebrated its fifth birthday,

Continued on page 47

BLUE BEAT

Downsizing days

Deidre Depke

IBM spent much of its time last year focusing on connectivity and communications. These are subjects that came to light through IBM's battle with Digital Equipment Corp. IBM didn't have much choice in the matter; DEC established the battleground through its advertising and sales forces' promises of seamless integration to customers.

So, faced with a declining mid-range market share and corporate accounts that wanted to know why IBM couldn't match DEC's claims, IBM began to respond.

IBM's Systems Application Architecture (SAA), announced last spring, embodies the company's long-term promise of connectivity. SAA is to the late 1980s and early 1990s what Systems Network Architecture (SNA) was to customers back in the 1960s and 1970s. Like SNA, SAA has started its life as a guideline — more theory than product. For SAA to be effective, it must evolve into an architecture of even greater magnitude than SNA.

For the short term, IBM's immediate connectivity focus lies in the mid-range. During the past two years, IBM has made a significant attempt to address its lack of a coordinated mid-range product strategy. Still, IBM has only begun that process.

Today, the firm either actively supports or markets seven distinct product lines in the mid-range: the RT Personal Computer, the System/88, the Series/1, the System/36 and 38, the 9370 and the 4381. To this list, the company will soon add

Continued on page 47

Cluster controller to link 80386-based micros in nets

Star Gate Technologies, Inc. in Eastlake, Ohio, unveiled the CC-9000 cluster controller to link Intel Corp. 80386-based microcomputers in networks.

A stand-alone communications controller, the CC-9000 enables 386-based personal computers to support 16 or more terminals and four printers. Using unshielded twisted-pair telephone wiring, the vendor claimed, a user can connect terminals and peripherals that are up to 800 ft away from the PC.

Star Gate added that two CC-9000s on a single host PC with a dual AT&T Starlan network minihub can be arranged to allow multiuser systems to support up to 16 serial and four parallel ports from a single serial slot.

Going the distance

In a system with an 80386 host PC and two cluster controllers, each controller can be located 800 ft from the PC in opposite directions, providing a total linear system length of 1,600 ft. Adding a 50-ft RS-232 distance between terminals, the CC-9000 gives a reported total end-to-end system length of 1,700 ft.

Commenting on the relatively slow programmable maximum bit/sec. rate of 38.4K bit/sec. with a constant speed of 19.2K bit/sec. on all eight channels, Ray Wymer, Star Gate Technologies' cofounder and director of research and development, said that the speed is deceiving. Data buffering helps off-load some of the data processing tasks from the controller's 512K-byte on-board CPU, increasing data throughput on the network.

"Remember, AT&T's Starlan is for smaller networks than are IBM's Token-Ring or thin-wire Ethernet networks," Wymer said. "I feel there is enough bandwidth and speed in Starlan applications right now for our users."

In its initial release, the CC-9000 runs the PC-MOS/386 operating system from The Software Link, Inc. in Atlanta, though Wymer said there will be a Unix version out in 1988. "If it's a fairly well-behaved MS-DOS application, then it will run under PC-MOS/386 without a hitch," Wymer claimed. "PC-MOS also provides file- and record-locking capabilities, which are important in distributed net applications."

The CC-9000 costs $1,495 for an eight-port unit and $1,295 for an upgradable four-port unit. — STAN KOLODZIEJ

Circle Reader Service Number 180

Atari introduces Abaq

Radical chip design may redefine workstation connectivity

Atari Corp. has introduced Abaq, a personal workstation based on Inmos, Inc.'s advanced Transputer 32-bit microprocessor. The Atari machine could signal the beginning of a movement toward the Transputer as the microprocessor of choice in situations that require parallel processing or extreme connectivity.

The Transputer is produced by British company Inmos Ltd., whose U.S subsidiary Inmos is headquartered in Colorado Springs. It has one of the most radical new designs of current microprocessors and differs from conventional processors in that the Transputer is meant expressly for parallel processing and multiprocessing. Its on-chip communications facilities allow it to link directly to other Transputers.

The Abaq workstation boasts an Inmos T-800 Transputer, which is capable of operating at 10 million instructions per second (MIPS) to 12 MIPS. Abaq will run under Helios, a Unix-like operating system from Perihelion Software Ltd. in Somerset, UK.

Until Atari announced the Abaq system last November, most Transputer-based systems were large, scientific machines, such as the Computing Surface from Meiko Ltd. in Bristol, England.

Abaq's sting, however, is in its connectivity. Because it is based on a Transputer, any individual Abaq workstation can be hooked to any other Abaq workstations through nothing more complex than their serial ports.

Users could form local-area networks with very little effort or shape their individual systems into a distributed multiprocessor system.

It is in this use of the Transputer to obtain connectivity that Abaq is unique. Virtually everyone else using the chip has done so to build stand-alone multiprocessor systems.

Sneak preview

As such, the Abaq could be a sign of things to come, as developers discover that the difference between two Transputers in a multiprocessing computer and two Transputers in linked workstations is only a matter of long or short connections.

In addition, the Abaq caps a series of recent Transputer developments. Increasingly, developers who work with microcomputers but who wish to go beyond the industry standard microprocessors — such as the Intel Corp. 80386 — seem to be turning to the Transputer.

For example, Mechanical Intelligence, a research and development organization

Continued on next page

Theirs takes hours.

Installing and configuring a 3270 or RJE remote host connection for BSC or SNA NETBIOS LANs? With the competition, it'll seem to take forever. While RabbitGATE™ takes just a few minutes. It's so easy that most people don't ever open the user guide.

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Continued from previous page

in Cardiff, Calif., recently rolled out a Transputer-based expansion system to bring parallel processing to the Apple Computer, Inc. Macintosh.

Although Mechanical Intelligence is a tiny firm and its product might be dismissed as simply an unusual experiment, there is support for the offering. In August, a noted Apple value-added reseller, San Diego-based Levco (a division of Scientific Micro Systems, Inc., located in Mountain View, Calif.) announced that it

Atari's *Abaq system*

had become the exclusive agent for the Mechanical Intelligence product. Other Transputer-based systems are bound to follow.

While they will probably never seriously challenge the positions of the Intel 80386s and Motorola, Inc. 68030s of the world, Transputer-based systems could cause a few uneasy moments for these leading chip makers. — MICHAEL TUCKER

Circle Reader Service Number 181

Tech Talk

Continued from page 43

(There are already rumors that some of the micro data base vendors are hiring every minicomputer person they can find.)

Which brings us to MCS.

Motorola's foray into the systems market actually began a long time ago with another company, Four-Phase Systems, Inc., a maker of data capture equipment founded in 1969. For the first decade or so, Four-Phase was a profitable little company, but by the early 1980s, it was rapidly being overtaken by events. Its data entry equipment was becoming obsolete in a hurry, yet Four-Phase lacked the research and development funds to modernize. Many analysts expected the company simply to vanish as one more fatality of the micro revolution.

Then, in 1982, Motorola purchased the firm. No one — not even company officials — seems to know why. On one hand, the acquisition made sense. It gave Motorola a captive buyer for its chips that would not directly compete with the scientific and engineering vendors that make up Motorola's customers.

But on the other hand, having a captive and using it effectively are very different things. Even as Motorola attempted to incorporate Four-Phase into its structure, it seemed uncertain about what it wanted out of the company, which it renamed Motorola Computer Systems. At times, MCS seemed to be in the data entry business for good. At other times, however, it appeared to veer toward the value-added reseller market. And on still other days, it appeared to target the small business computer world.

Did Motorola lack a clear strategy? No one but Motorola can tell us, and the firm is not talking.

But if MCS had an uncertain mandate in the past, that seems to be changing as of 1987. Judging from a series of recent product introductions, it looks as though MCS has a focus — and that focus is connectivity.

That's Life

For example, at Comdex/Fall '87, MCS showed a line of departmental-level micros, the 8000 series, some of which are based on Motorola's 68030 microprocessor. MCS was also selling Life, or the Linked Information Environment. The company describes the Life offering as "a unique data capture product that fully integrates data base, networking, print, office and analysis capabilities, providing customized solutions and faster information turnaround time while reducing pressure on MIS resources."

Life is meant to provide connectivity between desktop systems and mainframes using the 8000 machines as the middlemen. The market is still data capture, such as order entry, but MCS obviously has grander aspirations. The company already promotes the product for on-line transaction processing and office automation. And, perhaps, in some new and improved incarnation of the product, the company will target executive information systems as well. Indeed, MCS has already published white papers arguing for a new kind of computer use called "work group computing."

The concept of group computing is not new. People have been busily defining the connectivity market for quite some time. And MCS's success in that market is anything but assured. But that Life exists at all is interesting — at least given the constraints of Motorola's markets, which preclude competition with its own customers.

In other words, Life and the 8000 machines, like Intel's Multiservers, suggest that some of the industry's major players believe the world wants a new kind of microcomputer, a connectivity machine. This device wouldn't quite be a LAN server, or a gateway, or a multiuser system or a departmental computer but, rather, a machine combining the features of all of the above.

And more importantly, Motorola and Intel seem to believe there is a market here. They see a hole between mainframes and PCs. Apparently, they think they can move into that slot before anyone else — that is, their own customers — can do so.

If that market exists, and if Motorola and Intel are really serious about getting into it, the industry might change a bit. After all, DEC, too, was once known chiefly as a maker of components for other people's systems.

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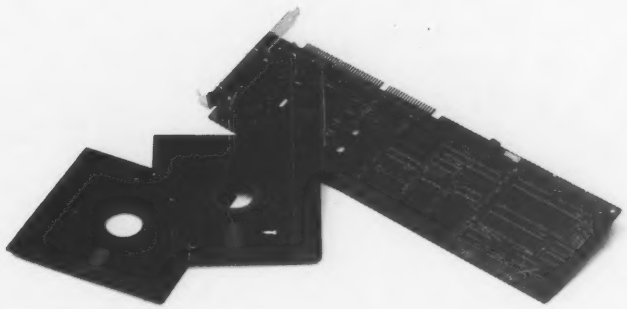

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PRODUCT CHECKLIST

Connect Computer Co. has announced **Lanscope,** a local-area network management system that runs on Novell, Inc.'s Advanced Netware LAN operating system.

Connect Computer claimed that Lanscope eases network implementation, management and network use by employing its universal network data base and workstation menus.

The complete Lanscope network management system is $1,295.

Connect Computer, Suite 220, 9855 W. 78th St., Eden Prairie, Minn. 55344.

Circle Reader Service Number 182

Atari Corp. has introduced **Moses PromiseLAN,** a local-area network that Atari claimed can connect up to 17 personal computers in a star configuration using regular telephone wire.

Atari said that the product meets IBM's Netbios standard, is compatible with IBM Personal Computers and compatibles and provides an interface to the Apple Computer, Inc. Appletalk network, enabling the connection of Apple Macintosh microcomputers to the network.

Moses PromiseLAN costs $599 and is scheduled for shipment in February 1988.

Atari, 1196 Borregas Ave., Sunnyvale, Calif. 94086.

Circle Reader Service Number 183

LAN Systems, Inc. has added two **windowing facilities** to **Release 2.0** of the **LAN Shell** network menu system.

Features include windows that display screen output from any Microsoft Corp. MS-DOS command; selection of files from a windowed directory listing; and new installation procedures.

According to the vendor, both windows can be placed anywhere on the screen in any size.

The LAN Shell costs $695 per server.

LAN Systems, 599 Broadway, New York, N.Y. 10012.

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CALENDAR

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Networking the Corporate PC. Denver, Jan. 7-8 — Contact: Digital Consulting, Inc., 6 Windsor St., Andover, Mass. 01810. Also being held Feb. 17-18 in Toronto, Ont., Canada.

Jan. 10-16

Choosing Applications for Expert Systems. Boston, Jan. 11-12 — Contact: Digital Consulting, Inc., 6 Windsor St., Andover, Mass. 01810.

X.25 Packet Data Systems. New York, Jan. 13-14 — Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

Fourth- and Fifth-Generation Data Management Software. Washington, D.C., Jan. 13-14 — Contact: Digital Consulting, Inc., 6 Windsor St., Andover, Mass. 01810. Also being held Feb. 10-11 in New York.

Desktop Publishing: A Practical Tutorial Featuring Product Comparisons. Seattle, Jan. 13-14 — Contact: Digital Consulting, Inc., 6 Windsor St., Andover, Mass. 01810.

Telecommunications Management. Orlando, Fla., Jan. 13-15 — Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

Jan. 17-23

Relational Data Base Management Systems. New York, Jan. 20-22 — Contact: Digital Consulting, Inc., 6 Windsor St., Andover, Mass. 01810. Also being held Feb. 17-19 in Chicago.

The 1988 Optical Disk Systems Conference: Making Order Out of Chaos. Phoenix, Jan. 20-22 — Contact: Jean O'Toole, CAP International, Inc., One Snow Road, Marshfield, Mass. 02050.

T-1 Users. Washington, D.C., Jan. 21-22 — Contact: Telestrategies, Inc., Suite 100, 1355 Beverly Road, McLean, Va. 22101.

Jan. 24-30

Software Maintenance: Controlling the Computerized Organization. Los Angeles, Jan. 25-27 — Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

Desktop Communications Conference. Anaheim, Calif., Jan. 25-27 — Contact: Susan Sanchez, Infonetics, Inc., Suite 100, 3235 Kifer Road, Santa Clara, Calif. 95051.

Laser Optical Systems: Image Technology and its Implementation. New York, Jan. 26-28 — Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

Jnet

Continued from page 43

and today has hundreds of installations on many different types of machines. It is easily one of the largest nonprofit, educational networks in the world.

Early in its life, Bitnet had to face the problems of linking disparate machines. Quite a lot of connectivity software was written by Bitnet users, and more was discovered or inspired by their efforts.

Among the latter group was Jnet. Though always a commercial product, Jnet has a vast percentage of its users in the academic world. Joiner said it has 280 academic customers at some 620 installations.

Thus, Jnet's particular strength is in its student users who then graduate and carry the product into the commercial world.

Jnet is like the Unix operating system in that it, too, entered MIS on the backs of graduating seniors. — MICHAEL TUCKER

Circle Reader Service Number 185

Blue Beat

Continued from page 43

the much-discussed Silverlake line, a replacement for the System/36 and 38.

While maintaining compatibility with the System/36 and 38 line, Silverlake will be housed in a 9370 form, thereby serving as a clear upgrade path from the System/36 and 38 to the 9370 and vastly improving the connectivity in IBM's mid-range.

But IBM's real connectivity and communications problems don't lie with disparate architectures and operating systems. IBM's connectivity problem lies in its revenue base. Because of their increasing power, particularly when networked departmentally, microcomputers are threatening IBM's minicomputer business. And because of an oversaturated market and increasing power and connectivity of mid-range products, IBM's mainframe business is also in jeopardy. The majority of IBM revenue comes from its largest systems; so as customers opt for smaller systems, IBM has an obvious problem.

IBM addressed the computer downsizing issue in a roundabout way at Comdex/Fall '87 in Las Vegas. At an IBM-sponsored meeting, two industry executives, in speeches doubtless approved by IBM, discussed the implications of this downsizing of the computer base. The Intel Corp. 80386 chip and OS/2 have made the minicomputer effectively obsolete, said Edward Esber, president of Ashton-Tate. "OS/2 and 386 hardware provide the clout of a minicomputer. We expect to get market share from mini vendors," he explained at the meeting.

Charles Wong, chief executive officer of Computer Associates International, Inc., made similar comments. "What today can be classified as a mainframe or a minicomputer will surely be on someone's desk in the future," Wong said.

No denying it

Later, in an interview, Frank King, IBM's vice-president of development in the Entry Systems Division (ESD), did not dispute these assertions, despite the fact that IBM is one of those companies destined to lose large systems market share. "It doesn't make sense to build artificial barriers," he said.

IBM's challenge now is to restructure its revenue base to allow for the downsizing of customer installations. Hence, its serious interest in software development. The company is also focusing on providing connectivity between small and large systems so that it doesn't lose what large systems sales are still out there. For that reason, IBM is working on incorporating VM emulation into the PS/2 and using OS/2's Presentation Manager to provide an interface for large-system software.

And a downsized computer base could also give IBM competitive advantages with companies like DEC and Compaq, which do not have the broad product lines that IBM offers. Eventually, this strategy will alter their ability to compete with IBM.

"The DEC battle is nowhere near as important to IBM as communications between the PS/2 and mainframes. That makes DEC very vulnerable. The key to DEC's future is its ability to move up- and downstream with its products. IBM is in a much better position to provide seamless integration," an IBM supplier says.

Depke is the former editor of "IBM Watch," a biweekly newsletter published by International Data Group, located in Framingham, Mass.

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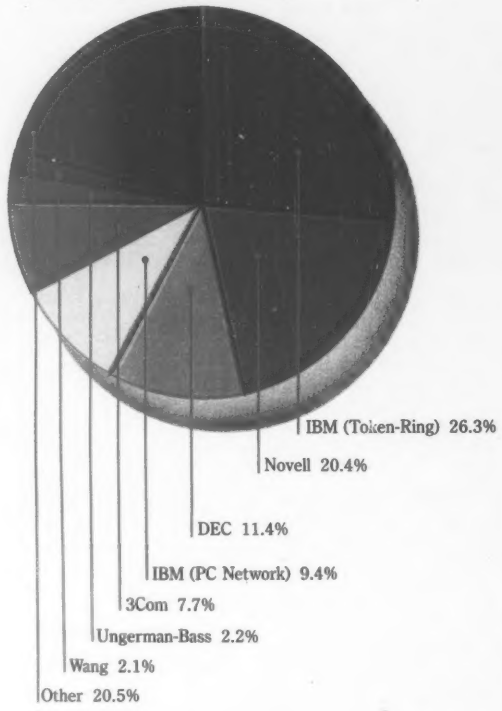
LAN market decisions

Local-area network vendors' share in IBM plug-compatible mainframe sites



INFORMATION GATHERED FROM A FOCUS RESEARCH SYSTEMS SAMPLE OF 1,215 SITES.

GRAPHIC BY BRUCE SANDERS

OF INTEREST

"We're not doing this because we love the technology. And we're not doing anything new. We're doing it to keep up with the competition."

PATRICK POWERS
LEE CO.

See story page 23

next issue

Software is the main thrust of February's *Computerworld Focus*. We'll seek answers to the software questions lurking behind Intel 80386 servers and see what's new in application development tools and fourth-generation and objective languages. February *Focus* will also cover operating systems like OS/2 and MVS/XA as well as IBM's grand connectivity scheme, SAA. Capping it all is a Special Section on the commercialization of Unix — it's not just for scientists any more.

The busing issue

Michael D. Millikin

After IBM announced its Micro Channel bus architecture, some of its competitors slammed the firm for trying to close the "open" Personal Computer architecture.

Such a reaction completely misses the point. The personal computer has a more complex role to play in future information architectures as a user's window into the corporate network. But to fulfill expectations, these desktop boxes need much more than a powerful CPU — they need to become systems with additional sophistication and capability.

THE INSIDER

The ultimate significance of the Micro Channel is not that IBM developed it, or that it doesn't accept old Personal Computer AT-style cards, or that it is faster than the old AT bus, or that it identifies add-on cards or even that it offers a true 32-bit bus on the IBM Personal System/2 Model 80. Overshadowing all these pluses is the Micro Channel's ability to support multiprocessing.

Multiprocessing will be a key PC architectural feature in the future and will be especially important in areas such as communications. Under a Micro Channel-style architecture, a coprocessor board will handle those communications-intensive tasks the PC CPU now laboriously manages.

IBM is drawing a lot of heat for its strategy, mainly because such multiprocessing add-in cards are still a long way off, and people have their eyes fixed on the AT bus cards populating the world. But you just can't create as efficient a PC system with an old-style AT bus.

IBM is not the only vendor offering a 16- or 32-bit bus structure supporting multiprocessing, however. AST Research, Inc. recognized the significance of Micro Channel-type multiprocessing and responded with its Smartslot Architecture. Smartslot supports multiple processors while still offering three slots for old AT-type cards.

But AST's efforts aside, there already is a standards-based alternative to the Micro Channel — the Nubus. A technical subcommittee of the IEEE endorsed the Nubus as a standard for 32-bit micros The Nubus has a bus arbitration scheme that allows up to seven processors to seek control of the bus simultaneously, providing multiprocessor support akin to that of the Micro Channel. Two vendors currently are working with the Nubus: Texas Instruments in its Explorer and 1500 series and Apple in the Mac II.

An opportunity exists for a vendor that creates an Intel 80386-based PC using the Nubus. That vendor could offer support for multiprocessing, have the sanction of a standards body and also have access to add-in cards developed for the Mac II. (In theory, you could interchange Nubus boards between systems.) Such a vendor would be competing functionally with the Micro Channel without having to license IBM technology. Not only that, but users would be that much closer to having systems-quality PCs on their desks.

Millikin is vice-president and senior analyst with Patricia Seybold's Office Computing Group in Boston.

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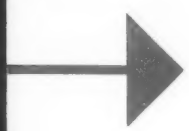

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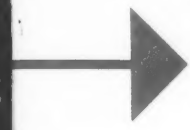

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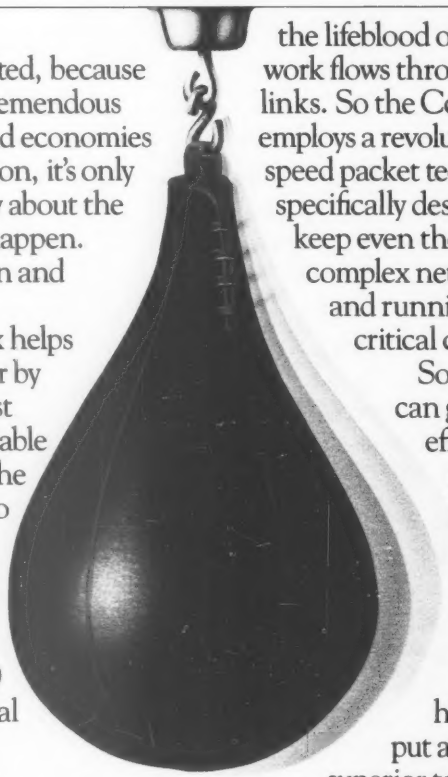

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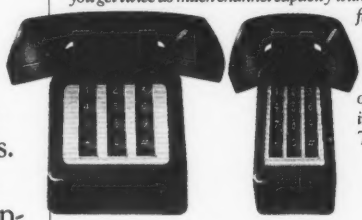

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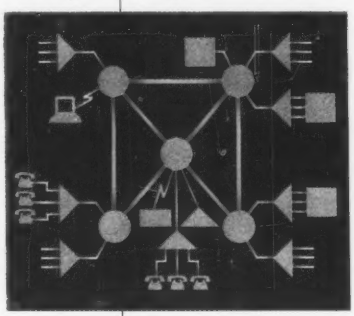

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